FOSTERING CONSTRUCTIVIST TEACHING BELIEFS IN ENGLISH LANGUAGE CLASSROOMS THROUGH THE IMPLEMENTATION OF PARTICIPANT-DRIVEN WORKSHOPS, PROFESSIONAL LEARNING COMMUNITIES, AND COACHING FACILITIES WITHIN A PROFESSIONAL DEVELOPMENT STRUCTURE IN INDIA

by

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Abstract

Several education policy initiatives in India have failed to improve students' reading comprehension achievement. It is widely recognized that students' comprehension is critical to overall academic achievement. A review of the literature and a needs assessment at a special needs private school in Mumbai, India revealed teachers' traditional beliefs about learning and teaching, and instructional practices in the classroom were impeding student's comprehension scores. A mixed methods study was conducted to determine if participant-driven workshops, professional learning community meetings, and coaching sessions embedded within a constructivist professional development framework over a three-month period would be effective in enabling teachers to adopt more constructivist beliefs and classroom practices, thus influencing students' comprehension levels within the context. English language teachers (n = 9) at the school participated in three 3-hour monthly participant-driven workshops, four 45-minute bi-weekly professional learning community meetings, and eleven 1-hour weekly coaching sessions. The study findings demonstrated that when high to medium high fidelity was maintained with regard to delivery, adherence, and participant responsiveness, there were notable alterations on comprehensive professional development models for special education teachers and opportunities for more inclusive learning environments for special needs children.

Keywords: professional development, India, teachers' beliefs, classroom practices

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Dedication

This dissertation is dedicated to my mentor, Sensei Ikeda, president of the Soka Gakkai International, who taught me that victory in any endeavor is achieved by nurturing faith in the inherent possibilities of life, by rousing courage to challenge adversities with compassion, and by striving ahead with gratitude.

To my husband, Rishabh Shah, for loving me exactly as I am. His unwavering pride and conviction in my potential has urged me to advance with renewed energy and strength.

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Executive Summary

Students' Reading Comprehension Achievement

Students in India have demonstrated difficulty in reading comprehension despite targeted policies to address this problem. The results from the largest annual survey household survey in India for reading achievement in the country, the Annual Status of Education Report (ASER) indicated that only one-fourth of all 3rd grade students, 48% of children in 5th grade and 25% of children in 8th grade could fluently read 2nd grade texts (ASER Centre, 2014). Furthermore, the ASER 2007 study demonstrated a strong correlation between decoding and comprehension as evident by results that 85-90% of children in Grade 5 who could read were also able to comprehend the story. This problem is exacerbated for children with mild to moderate disabilities. Recent results from India have shown that 95% of children with disabilities have never received any education (Jha, 2004 as cited in Kalyanpur, 2008). Also, Singal (2015) reported that a high percentage of students with disabilities in India drop out of the school system. National Council for Educational Research and Training (NCERT) 2012 survey, conducted over 27 States in India demonstrated that 5th grade children with disabilities had significantly lower scores in reading comprehension as compared to their peers.

Several initiatives and policies have sought to address this issue by diversifying learners within classrooms by including students with mild to moderate disabilities (Bhatnagar & Das, 2013). These attempts at solutions include the Sarva Siksha Abhiyan [Education for All movement] in 2001, National Action Plan by the Ministry of Human Resource Development 2005, and Right to Education (RTE) in 2010. However, despite these efforts, problems persist. Students continue to demonstrate significant deficits in reading comprehension (Bhatnagar & Das, 2013).

Students' comprehension achievement is a crucial aspect of learning. It is shown to affect performance in other academic areas like math, humanities, and science (Krajewski & Schneider, 2009; Pearson, Moje, & Greenleaf, 2010); hence it impacts overall functioning in other subjects (Parkinson, Meakin, & Salinger, 2015). Further, researchers have revealed a high correlation between students' comprehension scores and school achievement (Watson, Gable, Gear, & Hughes, 2012). Since underperformance in English comprehension has implications on students, it poses greater threats if left unchanged.

Understanding the Drivers of This Problem

Review of the Literature. A literature review was undertaken to understand the associated drivers of the low comprehension achievement of diverse students in schools. Associated drivers of students' low comprehension achievement include macro and micro variables. The macro factors are related to government funding (Wyckoff & Naples, 2000), educational policy (Batra, 2005), and s ocio-cultural factors, such as knowledge about the student's values, attitudes, family, religion, customs, language, and general lifestyle (Milner, 2011). The micro factors include the school and home environment. The school microsystem, in which the child participates, includes factors related to the teacher, including teacher pedagogy and beliefs, and the school environment. The family microsystem incorporates the home literacy environment, which consists of the daily interactions between the child, the parents, and other family members that contribute to the child's literacy environment (Niklas & Schneider, 2013).

Students' comprehension achievement is influenced by teacher's pedagogical practices within the classroom (Lyon & Weiser, 2009), which in turn were developed and enhanced by teachers' pre-service (Vijaysimha, 2013) and in-service teacher training programs (Dharan, 2015; McCutchen et al., 2002; McKenzie, Sharp, Paxton, & Murray, 2002; Singer, Lotter, Feller, & Gates, 2011), and teacher's understanding of the socio-cultural

factors related to the teacher and child (Brown & Kraehe, 2010; Clarke, 2003; Kukari, 2004; Moore, 2008). Teacher's beliefs about learning and teaching were found to be a significant component, impacting teacher's classroom practices (Carrington, Deppeler, & Moss, 2010; Murphy, Delli, & Edwards, 2004). Additionally, factors related to the school, including teacher turnover (Guin, 2004; Khawary & Ali, 2015), school resources (Du & Hu, 2008; Haelermans, De Witte, & Blank, 2012; Murillo & Roman, 2011; Sullivan, Perry, & McConney, 2013), and class size (Bosworth, 2014; Sawhney, 2015) were also found to effect student achievement. The student's home literacy environment (Bruns & Pierce, 2007; Kalia & Reese, 2009) was also linked to student's literacy achievement. Lastly, the impact of government funding on student achievement (Häkkinen, Kirjavainen, & Uusitalo, 2003) was also considered.

Needs Assessment. The literature review revealed a plethora of drivers impacting low comprehension achievement of students in schools. The mixed methods needs assessment was conducted in the spring of 2016, in a special needs private school, with 53 students between the ages of 6-16 years, in urban Mumbai, India. The students' profiles ranged from mild to moderate disabilities, including Learning Disabilities (LD), Autism Spectrum Disorder (ASD), Cerebral Palsy, Attention Deficit Hyperactivity Disorder (ADHD), Down Syndrome, Fragile X, and others. The objective was to understand which of the drivers related to the student's teachers and home had a significant impact on students' poor comprehension achievement. Specifically, the teacher factors considered included teacher pedagogy, pre and in-service teacher education, teacher's knowledge regarding the socio-cultural aspects of the child, teacher beliefs and efficacy, and teacher turnover, as well as students' home literacy environment.

Teachers' classroom observations demonstrated that teacher's pedagogical practices in the classroom significantly impacted the student's comprehension scores. Additional

qualitative data from teacher's interviews revealed that teacher pedagogy was significantly influenced by teacher's beliefs about learning and teaching and in-service teacher education. The teacher survey results demonstrated that teachers with a constructivist teaching approach had a positive impact on student's comprehension scores. Additional survey findings did not reveal a positive relationship between teacher self-efficacy and student comprehension achievement, as well as between the student's home literacy environment and student's comprehension scores. The findings concluded that teachers' traditional beliefs were associated with classroom management. These qualities included maintaining control, setting rules, and providing fixed schedules. In addition, traditional beliefs were related to classroom teaching practices such as the over reliance on textbooks and guides, limited assessment tools and procedures, and and high teacher control in the classroom. Teachers also demonstrate a diminished understanding of student knowledge, instructional approaches, student engagement, and adopting responsiveness and flexibility in instructional practices. These aspects were associated with students' low English comprehension achievement.

Developing an Intervention

The review of literature and needs assessment results indicated teachers' instructional practices and beliefs as hindering the students' English comprehension achievement. The teachers' beliefs included the role of the learner and teacher in the learning process. Based on literature findings, the proposed intervention included remodeling teacher education at either the pre (Batra, 2005; Brinkmann, 2015; Vijaysimha, 2013) or in-service (Arce, Bodner & Hutchinson, 2014; Guskey, 2002; Desimone, 2009) level. Since India continues to adopt a centralized policy-making practice that allows the teacher training curriculum to be developed by individuals removed from specific contexts of teaching (Dyer et al, 2004), it was not feasible to influence the existing pre-service teacher education. Further, remodeling the in-service teacher education program was more convenient, and less costly within the

context. Additionally, modifying teacher education at the in-service level was more feasible given the time and resource constraints within the context.

The current traditional workshop-oriented professional development model with insufficient teachers' active participation (Batra, 2005), provided teachers with a fixed schedule, was not embedded into the teacher's classrooms, and had a lack of follow-up support structures (Clarke & Hollingsworth, 2002; Ng & Tan, 2009; Spilkova, 2001; Svendsen, 2016). Yet, effective professional development models as described in literature include the following features, (a) focused content (Jeanpierre, Oberhauser, & Freeman, 2005; Shulman, 1987) (b) participants' active learning (Borg, 2011; Caudle & Moran, 2012; Desimone, Porter, Garet, Yoon, & Birman, 2002), (c) coherent professional development activities (Darling-Hammond & McLaughlin, 1999; Penuel, Fishman, Yamaguchi, & Gallagher, 2007), (d) reflective practices (Larrivee, 2000; Vijaya Kumari, 2014), (e) prolonged professional development sessions (Guskey, 2002), (f) collective participation (Poom-Valickis & Mathews, 2013; Zepeda, 2003), (g) professional learning communities (Allen & Penuel, 2015; Chou, 2011; Hord, 1997), (h) coaching facilities (de Vries, van, & Jansen, 2013; Gulamhussein, 2013), and (i) differentiation (Marx, 2014).

In consideration of these features, the intervention included modifying the current traditional workshop-oriented professional development model (with insufficient teachers' active participation, fixed schedules, lack of follow-up support structures and embedding into the teacher's classrooms) to embed it in constructivist principles, which emphasized the active involvement of participants (Desimone, 2009; Guskey, 2002; Ng & Tan, 2009). In addition, the model offered the English language teachers at the school opportunities for reflection (Farrell & Ives, 2015; Schön, 1983) using three different platforms, participant-driven workshops, professional learning community meetings, and coaching sessions. The workshops covered content related to specific subject related matter (language), the specific

methods and strategies required for teaching, knowledge about the learner, the learning process, and pedagogical content knowledge (Jeanpierre et al., 2005). The PLCs provided teachers the opportunity to actively engage in inquiry (Dufour & DuFour, 2013), and collective sensemaking of the content (Gersten, Dimino, Jayanthi, Kim, & Santoro, 2010), established a 'shared professional culture' (Garet et al., 2001, p. 922), and engaged teachers in reflective exercises (Brock & Carter, 2015). The coaching sessions supported teachers in examining and developing their beliefs, while testing new frameworks about teaching and learning (Borg, 2011; Larrivee, 2000).

Implementing the Intervention

A professional development model influenced by the needs assessment and literature review was designed and implemented. The intervention consisted of three 3-hour participant-driven workshops provided on a monthly basis, four 45-minute professional learning community meetings provided on a bi-weekly basis, and eleven 1-hour coaching sessions on a weekly basis for the English language teachers at the school. A mixed-methods approach using an embedded design was used, as a single quantitative strand would not provide sufficient data to answer the following research questions:

1. To what extent did the professional development provide members with participant driven workshops, coaching facilities, professional learning community meeting spaces, reflective practices, structures (space and time), and a culture of trust on an ongoing basis for the intervention period?
    a. To what extent did members participate in professional development sessions, including participant driven workshops, coaching meetings, and professional learning community meetings?
2. How did teachers' exposure to professional development lead teachers to adopt more reflective practices, increase their awareness of beliefs and discrepancies between

their beliefs and practices, and increase their perceptions of knowledge and skills in constructivist teaching and learning?

3. How did teachers' exposure to the professional development and the short-term outcomes (i.e. increase in teachers' 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, and 3) perceptions of knowledge and skills in constructivist practices) change their beliefs about teaching, their efficacy, instructional practices in the classroom, and the alignment between their beliefs and practices?

The intervention was implemented in the spring of 2018 with 9 teachers who have worked at the school for six or more months. Since two teachers had to drop out of school in the middle of the year due to unforeseen personal reasons, the data for only 7 English language teachers was included in the final analysis.

Results and Discussion

There was high to medium high fidelity with regard to 3 aspects; delivery, adherence, and participant responsiveness. Specifically, there was high fidelity with regard to the delivery of the coaching and workshop sessions, and medium high fidelity for delivery of the PLC sessions. Fidelity in terms of adherence of sessions was high as all PD sessions included reflective opportunities, inquiry practices, structures (time and space), and a culture of trust. Further, with regard to participant responsiveness, there was medium high fidelity.

The teacher's qualitative data responses in different PD sessions and teacher interviews showed that teachers regarded the PD sessions as positively impacting their reflective practices, increasing their awareness of discrepancies between their beliefs and classroom practices, and enhancing their perceptions of knowledge and skills in constructivist teaching and learning. The PD sessions and increased teacher's reflection, awareness of discrepancies in beliefs and practices, and perceptions of knowledge and skills in

constructivist teaching and learning further led to significant changes in teacher's beliefs from traditional to more constructivist approaches from the needs assessment to post-intervention. In terms of efficacy, even though the findings reveal an improvement in teacher's personal and overall efficacy, there was no modification in teacher's general teaching efficacy scores. Also, the teacher's classroom practices showed an improvement post the implementation of the PD model. The study was unable to capture the impact of the PD model on student achievement due to the limited duration of the study.

The limited sample size in an independent school setting limits the generalizability of the results of the professional development model on teacher's beliefs and practices in other school settings. Additionally, the lack of a control group in the study does not allow for causal effects of the intervention to be studied. Lastly, the repeated use of instruments and the design of some instruments within the study could introduce bias into the findings.

In sum, the professional development intervention was effective in influencing teacher's beliefs and practices and hence can be extended to other schools. Additional support from school leaders and administrators would enhance the provision of the professional development model to teachers within school settings.

CHAPTER 1 – UNDERSTANDING THE PROBLEM OF PRACTICE

Overview of the Problem of Practice

In India, the implementation of several policies and initiatives, including the *Sarva Siksha Abhiyan* [Education for All movement] in 2001, National Action Plan by the Ministry of Human Resource Development 2005, and Right to Education Act (RTE) in 2010 have led to the inclusion of children with mild to moderate disabilities in mainstream classrooms reflecting a wider range of diverse learners in today's classrooms (Bhatnagar & Das, 2013). Even though the government has been dedicated to improving the prospects for education for children with disabilities, the evidence of such reforms has failed to be displayed in the classroom practices in India (Batra, 2005). The National Council of Education Research and Training (NCERT) survey is conducted over 27 states in India. The NCERT (2012) survey results showed that students with disabilities in 5th grade had lower reading comprehension scores as compared to their peers. Unfortunately, this problem is also present for those in general education.

A significant percentage of students in rural and urban India are not demonstrating basic reading comprehension and arithmetic skills (National Council of Educational Research and Training, 2011). In the Programme for International Student Assessment (PISA), which is a global assessment across reading, math and science, held in 2009, India stood at the 72nd place of a total of 73 countries (Chhapia, 2012). The Annual Status of Education Report (ASER), the largest annual household survey in India for reading and mathematics achievement in the country, uses tools that are available in 16 Indian languages and in English. The ASER revealed that in 3rd grade, only one-fourth of all children could read a 2nd grade English text fluently. Further, 48% of children in 5th grade, and 25% of children in 8th grade could fluently read grade two texts (ASER Centre, 2014). The ASER results also reveal that a child's reading ability is not limited to decoding but also includes their ability to make

meaning and understand the text. This is evident from the ASER 2007 results, which demonstrated that 85-90% of children in Grade 5 who could read were also able to comprehend the story. Since the ASER 2007 results demonstrate a strong correlation between decoding and comprehension, a separate measure for comprehension has not been included in the ASER toolkit since 2007 (ASER Centre, 2014). Based on above stated reports, it can be concluded that diverse student learners in special needs and general education classrooms in India are demonstrating low English comprehension achievement and show little improvement overtime.

As a result, the students demonstrate a huge deficit in their comprehension achievement within these diverse classrooms (Bhatnagar & Das, 2013). These findings are especially significant as student comprehension achievement is a crucial aspect of learning due to its impact on performance in other academic areas like math, humanities, and science (Krajewski & Schneider, 2009; Pearson, Moje, & Greenleaf, 2010). While the problems related to student achievement are numerous, the scope of this dissertation will be limited to examining student comprehension, and the underlying teacher factors, and environmental factors for student comprehension disparities.

Teaching Practices, Teacher Beliefs, and Teacher Training

Teachers' instructional or teaching practices in the classroom are considered one of the most crucial factors in research as impacting student achievement (Batra, 2005; Desimone, 2009; Neuman & Cunningham, 2009). As a result, it follows that improving student outcomes in schools is closely linked to modifying teachers' classroom practices (Batra, 2005; Desimone, 2009; Neuman & Cunningham, 2009). Yet, literature studies indicate several impediments to student learning as it relates to teacher practices in India such as, traditional teaching practices, traditional teacher beliefs, teacher schooling and preparation, and ineffective professional development. Research literature in the field

highlights the differences between teacher-centered and student-centered teaching approaches as related to goal setting, teacher's roles, motivation orientations, assessments, and students' interactions (Pedersen, 2003).

Traditional Teacher-Centered Practices. In a traditional, teacher-centered approach, the teacher sets the goals and objectives by adopting a more directive role, manages student interactions, and employs the use of extrinsic motivators like grades and marks to encourage students (Pedersen, 2003). On the other hand, in a student-centered constructivist classroom, teachers encourage students to take charge as they make decisions regarding what they need to know and do, to interact and collectively engage in learning with their peers, and use more problem and project learning (Pederson & Liu, 2003). Hence it can be concluded that the traditional teacher-centered approach holds students as passive recipients, whereas the constructivist, student-centered approach places the student at the center of learning process (Thomas, 2013).

Traditional teaching practices that consider learning a process of knowledge transmission are considered ineffective as the learner is regarded as a passive recipient of knowledge, and is provided with limited opportunities to interact with the information presented (Aldrich & Thomas, 2005; Batra, 2005; Brinkmann, 2015). A review of 416 classrooms in both public and private schools across India found that teachers used traditional methods of instruction where the role of the teacher was paramount and students were passive participants in the learning process (Singh and Sarkar, 2012).

Teacher Beliefs. In addition to teacher training, researchers have also attributed the failure of constructivist inspired policies to be realized in classroom practices to the lack of attention to the teacher (Batra, 2005). More specifically, Brinkmann, (2015) has attributed the unrealized effects of reforms to the discrepancy between teacher's beliefs related to learning and teaching and the constructivist principles that form the basis of the policies and

programs. Research shows how teachers' beliefs influence their teaching practices (Chan, Tan, & Khoo, 2007; Doruk, 2014; Fajet, Bello, Leftwich, Mesler, & Shaver, 2005; Kukari, 2004; Leavy, McSorley, & Bote, 2007; Moore, 2008; Sang, Valcke, Tondeur, Zhu, & Van Braak, 2012; Stuart & Thrulow, 2000; Taskin-Can, 2011; Yilmaz & Sahin, 2011).

Since teachers' beliefs are the combined result of personal life experiences, experiences as a student, and experiences with formal knowledge (Enderle et al., 2014; Richardson, 1996; Riojas-Cortez, Alanis, & Flores, 2013; Tillema, 2000), the teachers' beliefs are well constructed before they enter training programs (Murphy, Delli, & Edwards, 2004). In addition, as teachers in India are more likely subjected to traditional approaches to learning and teaching (Batra, 2005), and they have received limited opportunities to challenge their beliefs, teachers' classroom practices do not echo the reform initiatives, and instead teaching practices more strongly reflect cultural aspects embedded into Indian educational institutes (Nargund-Joshi, Rogers, & Akerson, 2011). Furthermore, in spite of a strong influence of cultural factors on teacher pedagogy, India continues to adopt a centralized policy-making practice that allows the teacher training curriculum to be developed by individuals removed from specific contexts of teaching, resulting in lack of consideration of contextual influences (Dyer et al., 2004). Likewise, teachers' beliefs are often unchallenged. As such, teachers tend to immaturely merge the recently acquired ideas into their pre-existing beliefs and continue to operate from their previous well-established belief structures (Richardson, 1996).

Teacher Training. Literature studies indicate that in India, a fifth of elementary school teachers do not have the required qualifications to teach (Varmal, 2015). The Ministry of Human Resource Development (2014) has also highlighted the lack of qualified teachers in the country as a concern. Additionally, the poor certification standards are also found to

hold true for special education teachers in the country. One study revealed that there were fewer than 1,000 special education teachers in India (Sharma & Deppler, 2005).

Other research demonstrates the potential of teacher professional development programs in enhancing classroom-teaching practices (Borko 2004; Richardson and Placier 2001; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Yet research situated in the Indian context reveals that the quality of the professional development training, the inconsistency between the desired approach and training methods, and other barriers within the classroom, like structures, and resource availability result in the failure of professional development programs (Brinkmann, 2015). Moreover, research demonstrates that teachers receive little or no in-service training in the school setting in India (Hodkinson & Devarakonda, 2009). Finally, teachers' own schooling and training experiences in institutions which reflect more traditional notions of education, as well as the lack of teacher education programs in India (Vijaysimha, 2013) do not allow teachers to develop the necessary knowledge and skills required to echo the policies initiatives (Batra, 2005).

Current Study Context

The current study takes place in a special needs private school in an urban setting, Mumbai, India. The school has 53 students, between the ages of 6-16 years, diagnosed with mild to moderate disabilities, including Learning Disabilities (LD), Autism Spectrum Disorder (ASD), Cerebral Palsy, Attention Deficit Hyperactivity Disorder (ADHD), Down Syndrome, Fragile X, and others. Student scores in this school on the Comprehensive Assessment of Reading Strategies (CARS) test reveal that they are not meeting their grade level comprehension goals and are making little progress.

Problem of Practice

Students' English comprehension achievement is a problem at the Indian school under study. This is demonstrated by poor comprehension outcomes, which have remained

primarily unchanged over the last three years. Underperformance in English comprehension has implications on students (Watson, Gable, Gear, & Hughes, 2012) and thus poses greater threats if left unchanged.

Research highlights the significance of comprehension outcomes for students. A high correlation exists between students' comprehension and school achievement (Watson et al., 2012). Additionally, comprehension is also shown to have other enduring outcomes in academic development, as comprehension impacts overall functioning across subjects (Parkinson, Meakin, & Salinger, 2015).

The current research is driven by the need to synthesize findings from the context, based on the special needs population, using a variety of data analytical tools and relate those to the current problem at hand, within the context of Indian urban schools. Given that there are multiple, diverse factors related to the problem, an ecological systems theory (EST) framework (Bronfenbrenner, 1977; Neal & Neal, 2013) is used to analyze the problem through a systemic lens. This lens serves to provide a more holistic understanding of the problem that will aid in planning an intervention that will address salient factors contributing to the comprehension outcomes within this context.

Theoretical Framework - Networked EST

This study relies on the networked ecological systems theory (Neal & Neal, 2013) to understand student achievement. Bronfenbrenner's (1977, 1979) ecological systems theory (EST) is one of the most pivotal theories of human development, as it recognizes the five subsystems that guide human growth; the microsystem, mesosystem, exosystem, macrosystem, and chronosystem.

Microsystems include activities, roles, and interpersonal relations in a face-to-face setting with particular physical and material characteristics, such as, family, school, peer group, and workplace. Mesosystems involve the processes in two or more settings with the

developing person, such as relations between home and school, school and workplace, etc. Exosystems comprise two of more settings, one or more of which do not involve the developing person, but in which events affect the setting with the developing person. Macrosystems include broad cultural influences or ideologies that have long-ranging consequences for the focal individual (p.22). Lastly, the chronosystem, which was later introduced into the model, is a system reflecting change or continuity across time that influences each of the other systems (Bronfenbrenner, 1986). Neal and Neal (2013) re-conceptualized the original nested model as networked, with an overlapping arrangement of structures, each connected in some way to the other by varying patterns of social interaction. This networked model lays emphasis on the interactions between different individuals within these connected systems.

Networked EST and the Problem of Practice

In this study, the focal child is part of two different settings, the family and school microsystems. The home literacy environment (Schmitt, Simpson, & Friend, 2011), one of the factors considered in this study is part of the family microsystem within the networked ecological theory. This part of the microsystem consists of the daily interactions between the child, the parents, and other family members that contribute to the child's literacy environment (Niklas & Schneider, 2013). The school microsystem, in which the child participates, includes factors related to the teacher, including teacher pedagogy and beliefs, and the school environment.

The school and family microsystems are contained within the broader macrosystem that is the broad cultural influences in the country. Factors within the macrosystem include the governmental entities such as officials and educational funding (Wyckoff & Naples, 2000) and educational policy (Batra, 2005), and socio-cultural factors (Milner, 2011).

Additionally, the child is not an active participant in the exosystem but the social interactions within this system indirectly influence the child (Bronfenbrenner, 1977).

Special Education in India

The Right to Education (2010) Act was framed with the purpose of providing equal educational opportunities to all children. This act was the first attempt at recognizing students with disabilities as an independent group from other disadvantaged populations. Yet, it does not include children below six years of age. It further recommends that students with disabilities be provided for separately and as a result it steers away from inclusive practices. In addition, decentralization policies have led the central government to shoulder only 75% of the total expenditure, as they assume state governments to meet the other needs, which fails to be realized (Bhushan, 2006; Mohapatra, 2004).

In addition, the Sarva Shiksha Abhiyan (SSA) program also referred to as Education for All, in India (2003) allows for an all-inclusive model of quality education, including children with disabilities (Kalyanpur, 2008a; Rao, 2008). This program allocated R1200 per annum per child with a disability, in order to provide any tools, resources, or materials required for the child with disability to be included within a mainstream classroom. Since the district or school direct the flow of money, there exists several difficulties with accounting for the allocated money. Yet, despite the recommendations from the program, less than 1% of the total allocated money for the Sarva Shiksha Abhiyan (SSA) program is used for inclusion (Ministry of Human Resource Development, 2014).

The most recent development is the revised policy of Scheme of Integrated Education for the Disabled Children (IEDC), called Action Plan for Inclusion in Education of Children and Youth with Disabilities (IECYD) in 2005. The IECYD proposes that schools will be modified with appropriate physical accommodations and instructional tools to provide for all children, even those with special needs (Ministry of Human Resource Development, 2005).

The government has allocated funds towards provisions for students with disabilities through Five-Year Plans since 1970. In the past the government has directed these funds towards NGOs, establishment of research institutes, and government funded inclusive schools. Yet, the latest tenth plan (2002 – 2007) reflects the government's commitment to earmark 3% of all resources allocated for rural development for individuals with disabilities (Kalyanpur, 2008a). Despite several attempts by the government to improve funding opportunities, the expenditures on education have remained fixed at 3.2% since 1996. Moreover, the policy recommendations have largely remained unrealized due to the bureaucracy, red tape and lack of accountability within government structures and systems (Rawat, 2004). Hence, in spite of several efforts, a large number of students with disability continue to be denied education given the poor financial support from the government.

As a result, a case study on inclusive schools in India demonstrated that policy recommendations and instructional strategies fail to be aligned (Sawhney, 2015). Kalyanpur (2008a) also demonstrated that the impact of the policies failed to be realized within classrooms, due to educators' and parents' limited knowledge regarding these reforms.

Further, India signed the Salamanca Statement and followed the west in adopting inclusion as an organization of education (Singal, 2005). However, researchers have highlighted the issue related to conceptualization of the term inclusion as misinterpreted, and different from that adopted by the west, leading to an arbitrary definition (Kalyanpur, 2008a; Singal, 2005). There are also issues related to categorization, as there are various definitions of disability in India, and there is a lack of consensus regarding the same (Kalyanpur, 2008b). The resulting lack of criterion or measures for children with disabilities, and a lack of uniformed understanding of instructional practices leads to the teachers as being the primary stakeholder involved in identifying, supporting, and meeting the needs of such children (Sawhney, 2015). One study on two inclusive schools in India revealed that only children

with mild learning difficulties were accepted to avoid the added provisions required for differentiation (Sawhney, 2015).

In addition, the cultural factors such as negative perceptions regarding disabilities in the country result in a lack of acknowledgement and acceptance of disability, leading to underrepresentation of the population (Kalyanpur, 2008b). One report stated that 95% of children with disabilities, totaling to 40% of the population with disabilities continued to be denied any form of education in India (Jha, 2004 as cited in Kalyanpur, 2008). In addition to cultural perceptions, the lack of access to education for children with disabilities can also be attributed to educational provisions for students in India on the basis of class.

Education in India is provided across different strata of society. In the low and middle income schools in the country, special and general education continue to be perceived as disparate systems, as individuals with special needs are disregarded for their lack of worth to an emerging economy (Shenoy, 2016). As a result, children with disabilities are catered to only in high-income private, urban schools or non-governmental set-ups in the country (Shenoy, 2016). Yet, the teachers are not trained to provide effective instructions for children with disabilities, and are ill equipped to cater to the differing needs of children in the class (Sawhney, 2015; Singal, 2005). Due to lack of special educators or assistant teachers in schools, a single teacher is in charge of a group of 40-45 children in the class (Sawhney, 2015). As a result, teachers' often regard education for children with disabilities as bonus or extra work, and not part of their existing responsibility (Singal, 2005).

In conclusion, the government initiatives have been largely unsuccessful in meeting its intended proposals due to several factors related to financial support, cultural perceptions, lack of consistent definitions of disabilities and inclusion, and educational provisions based on class structures in the country.

Underlying Causes and Factors

This literature review focuses on factors impacting the English comprehension achievement of diverse students, especially in special education urban schools. The factors considered in this review examine microsystems related to 1) teacher factors such as teacher pedagogy, pre service and in-service teacher training, teacher beliefs, teacher self-efficacy, teacher turnover, and knowledge of socio-cultural factors, 2) school factors such as lack of school resources and class size, and 3) family factors related to the home literacy environment. The factor examined from the macrosystem includes government policy. These factors are represented in Figure 1.1 below, followed by the synthesis of literature for each.

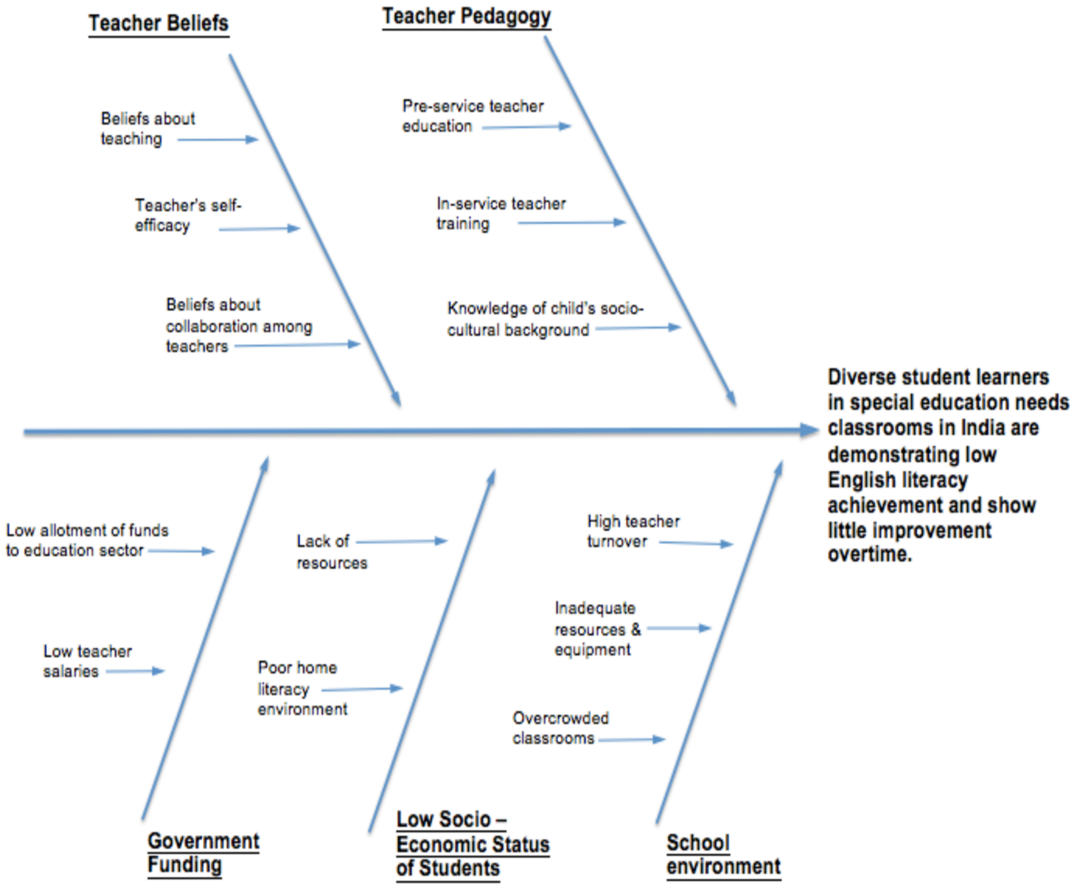

Figure 1.1 Fishbone diagram of the factors influencing the English comprehension achievement of diverse students.

Government Funding

Funding is essential for the achievement of high learning standards of all students as it ensures that all the resources needed to potentially meet the standards and the capacity to offer incentives towards the standard are provided (Unnever, Kerckhoff, & Robinson, 2000; Wyckoff & Naples, 2000). Further, funding is regarded significant in ensuring that students are provided with equivalent learning opportunities, including the provision of qualified teachers (Sciarra & Hunter, 2015) and core as well as additional learning programs (Jarman & Boyland, 2011). On the other hand, literature also provides studies that fail to demonstrate the impact of increased cost on student's achievement (Häkkinen, Kirjavainen, & Uusitalo, 2003; Parcel & Dufur, 2001).

India, the second most populous country on earth, had a population reaching 1.30 billion people in 2014. During that year, the GDP per capita growth was 5.98%, and India's GDP was 2.05 trillion U.S. dollars (World Bank). Even though the Education Commission in 1996 proposed that 6% of the income from the nation is expended on education, in 2012, the government expenditure on education was only 3.83% of the GDP (UNESCO). On the other hand, the United States has a population of 317 million people and the government expenditure on education was 5.22% of the GDP (UNESCO). These statistics reveal the vast discrepancy that exists between the two countries, with regard to their population and expenditure on education. India has a population that is approximately four times that of the United States, but the United States' government expenditure on education is approximately 1.3 times more that of India. Given the paucity of funding available for the large population, India continues to struggle with the issue of literacy in the country.

Singal (2015) discussed that under the Sarva Shiksha Abhiyan (SSA) scheme, an Indian Government initiative to provide education to all children between the ages 6 to 14, £78 million was allocated for students with special needs. Yet, the 2005-06 report revealed that only £2.3 million was expended towards the same. Also, the National Centre for

Promotion of Employment for Disabled People (NCPEDP) (2012) indicated that India allocates only 0.0009% of its GDP on disability that covers health, education, labour, and sports. The poor distribution of government funds for people with disabilities restricts the access to educational opportunities and additional provisions to improve student outcomes (Singal, 2015).

Teacher Pedagogy

Teacher pedagogy is defined within Charlotte Danielson's (1996, 2013) Framework for Teaching. The framework "identifies those aspects of a teacher's responsibilities that have been documented through empirical studies and theoretical research as promoting improved student learning" (Danielson, 1996, p. 1). It is "based on the Praxis III criteria developed by the Educational Testing Service (ETS) after extensive surveys of the research literature, consultation with expert practitioners and researchers, wide-ranging job analyses, summaries of the demands of state licensing programs, and fieldwork" (Danielson, 2007, p. 183). The act of teaching, according to this framework, has 22 components organized under four broad domains; planning and preparation, classroom environment, instruction, and professional responsibility. There are a total of 76 elements of teaching as each component has a number of elements within them. According to the official website[1] of the Danielson Group, (Danielson, 2013), The Framework for Teaching is the most widely used definition of teaching in the U.S. and has been adopted in over 20 states. The Danielson framework provides guidelines for a multitude of areas in which teachers need to develop competence when teaching.

Instructional delivery involves a wide range of teacher responsibilities that help connect the curriculum to the student (Stronge, Ward, & Grant, 2011). Teachers are responsible for student learning and hence generate different instructional involvements in the classrooms

[1] Danielson Consulting website https://www.danielsongroup.org/charlotte-danielson/

(Harbour, Evanovich, Sweigart, & Hughes, 2015; Pollock & Association for Supervision and,Curriculum Development, 2007). Odden (2004) revealed links between teachers' higher evaluation scores based on the Danielson (1996) Framework for Teaching and improvements in student achievement as measured by standardized tests. Furthermore, Palardy & Rumberger (2008) found teacher practices to be one of the most crucial elements in determining teacher effectiveness in the classroom.

Research studies using a range of data collection techniques, including observations, audio recording of lessons, interviews, questionnaires, and a collection of performance data, has consistently revealed that effective teachers focused on building authentic, positive relationships with their students and their families (Crawford, 2011; Flynn, 2007; MacSuga-Gage, Simonsen, & Briere, 2012; Stronge et al., 2011). Further, in his qualitative study, Crawford (2011) found that the effective teachers had positive contacts with the children's families, were available for students post class, demonstrated genuine care and concern while supporting their students, were transparent with their students, embraced positive attitudes and beliefs, connected the curriculum to their students, maintained clear, realistic student expectations, used affirmations and praise while challenging students beyond their current levels, and demonstrated high levels of dedication to the child's success. Also, in order to meet the needs of students with special needs in the classroom, close collaboration between teachers and other professionals is found to be beneficial. Collaborative efforts ensure that teachers' shared competencies promoted sufficient flexibility and increased interactions between teachers and students in the classroom (Buli-Holmberg & Jeyaprathaban, 2016).

Additionally, researchers have identified that effective teachers engaged in other practices in the classroom like providing instructions in an explicit and engaging manner (MacSuga-Gage, Simonsen, & Briere, 2012), and using feedback and monitoring practices (Al-Hilawani & Others, 1995). Similar practices, such as modeling, explicit instruction tools

and approaches, and encouraging different modes of reflective practices among students are found to be advantageous for the special needs population (Brownell, Ross, Colón, & McCallum, 2005). Additionally, effective teachers more often applied research based classroom management strategies (MacSuga-Gage et al., 2012), employed superior classroom management skills, experienced fewer classroom disruptions (Stronge et al., 2011), and facilitated independent learning in classrooms (Al-Hilawani & Others, 1995; Rugh, Harvard Univ, Cambridge, MA Inst for,International Development, & Others, 1991). Furthermore, practices found to be successful for students with special need included teachers providing different instructional approaches, subject content, and evaluation tools (Bateman & Bateman, 2002). Research studies in the field conclude that special education classroom instruction must be more individualized than general education classes (Tzivinikou & Papoutsaki, 2016).

Specifically in terms of language instruction, it was found that effective teachers integrated their knowledge of the different components of reading appropriately in their classroom instructions (Flynn, 2007; Lyon & Weiser, 2009), modified their instructional approaches based on individual student needs (Al-Hilawani & Others, 1995; Flynn, 2007; Lyon & Weiser, 2009), supported student learning through modeling and questioning techniques (Taylor, Pearson, Peterson, & Rodriguez, 2003), and engaged students in the classroom activities appropriately (Lyon & Weiser, 2009; (Taylor et al., 2003). It is thus evident that teachers' instructional practices impact student achievement directly.

Omar & Biddin (2015) conceptualize reading comprehension as "the cognitive and linguistic procedures that are based to understand the meaning of the word, sentence construction, and phrases" (p. 990). Literature has demonstrated the significance of visual teaching practices, aids, and strategies in supporting comprehension in students with learning disabilities (Omar & Biddin, 2015). Other researchers have also highlighted the value of using graphic organizers as a scaffolding tool for comprehension for special needs students

(Alturki, 2017). More specifically, the researchers showed how graphic organizers provide students the opportunity to arrange their background knowledge and new information in a manner to ease the generation of the main idea and details of the text (Alturki, 2017). Additionally, constructivist based practices that emphasize the student's active role in knowledge construction, provide students with opportunities for independent thinking, questioning and problem solution. Such constructivist practices are found to be beneficial in improving comprehension among students with learning disabilities as its' range extends to a broader variety of students (Akpan & Beard, 2016).

Teaching practices can be developed and enhanced through teacher education programs through preservice and in-service training. Since the factors covered in the Danielson Framework for Teaching relates to teacher planning and preparation, classroom environment, and instruction, those considered crucial in effective comprehension instruction, the Danielson Framework can be considered a valid measure of teacher pedagogy in the study.

Preservice teacher education. A report submitted by the Supreme Court and Ministry of Human Resource Development of India (Vijaysimha, 2013), which included a team of renowned educators and government policy makers headed by the former Chief Justice of India, assessed all institutions responsible for teacher training in the country and concluded that there was a lack of adequate capacity for teacher education within its education instituions. Vijaysimha (2013) further highlighted that the lack of teacher preparation was prevalent due to the dearth of institutes offering education programmes, and the limitations with the current one-year M.Ed. teacher education programme. The report pointed out some aspects related to the quality of teacher education instruction, including an unchanged curriculum in the past 25 years; lack of moral, ethical, and legal dimensions of their work; and redundant modes of pedagogy delivery and assessment. Additionally, the

review drew attention to the short duration of the teacher education programs, leading to a lack of adequate engagement with curriculum or pedagogy.

In addition, a host of studies have attempted to examine the learning experiences of teachers with regard to their readiness to work effectively within diverse classrooms (Das, Kuyini, & Desai, 2013; Forlin, Kawai, & Higuchi, 2015; Saravanabhavan, & Saravanabhavan, 2010; Singal, 2008; So & Watkins, 2005). Even though teachers need to be adequately prepared to meet the needs of the diverse students in the classroom (Wharton, Goodwin, & Cameron, 2014), most feel ill equipped with regard to having the required pedagogical content knowledge (Brown, Lee, & Collins, 2015) and the necessary abilities for classroom instructions (Goodwin, Smith, Souto-Manning, Cheruvu, Tan, Reed, & Taveras 2014).

Teacher education in India is segregated into general education and special education, and teachers in general education are not equipped with knowledge, skills, or attitudes required to meet the needs for children with disabilities (Sawhney, 2015). Further, the Bachelor and Master's education degree courses include special education as a noncompulsory course, with no access to real classrooms (Sawhney, 2015). Further, teacher training for special education falls under the purview of other agencies like Rehabilitation Council of India and Ministry of Social Justice and Empowerment (Sawhney, 2015). Even though the teachers were provided minimal training opportunities ranging from less than a month to over three months following the Sarva Shiksha Abhiyan (SSA) 2001 Act (Sawhney, 2015), overall the pre-service teacher education programs in India do not prepare teachers to work in diverse classrooms, including children with learning difficulties or special needs (Das, Kuyini, & Desai, 2013; Saravanabhavan & Saravanabhavan, 2010).

Studies from other countries, including Jordon, Japan, Australia, and Ethiopia, have shown similar results as well (Al-Hiary, Almakanin, & Tabbal, 2015; Forlin, Kawai, & Higuchi, 2015; Stephenson, O'Neill, & Carter, 2012; Tuli & Tynjälä, 2015). The lack of

teacher preparation extends in the realm of reading difficulties as well (Moats, 2014). Specifically, with regard to reading skills, the preparation programs do not seem to equip teachers sufficiently to support students with varying reading needs (Bishop, Brownell, Klingner, Leko, & Galman, 2010) or bridge the gap between theory and application in the classrooms (Bainbridge & Macy, 2008; Clark, Jones, Reutzel, & Andreasen, 2013). It is also shown that this lack of preparedness translates into in-service teacher education.

In-service teacher education. Studies from India and Kenya have demonstrated that teachers continue to receive little or no in-service training in the school setting (Hodkinson & Devarakonda, 2009), and more specifically with regard to the language and classroom management skills related to teaching special needs populations (Ergul, Baydik, & Demir, 2013; Gathumbi, Ayot, Kimemia, & Ondigi, 2015). Furthermore, studies have shown that teachers in schools continue to demonstrate limited knowledge with regard to various components of reading instruction for varying populations (Mahar & Richdale, 2008; Mather, Bos, & Babur, 2001; McIntyre & Hellsten, 2008). Most provisions of in-service teacher training are limited to the dissemination of knowledge through traditional workshop model where the participants play a passive role (Das, Gichuru & Singh, 2013), with limited opportunities for coaching, mentoring, or professional learning community meeting spaces. Moreover, the content and knowledge is not altered to fit into the specific context and continues to be delivered as a common approach across institutes (Singal, 2006). Researchers have revealed that inclusive schools in India fail to provide teachers with training needed to meet the needs of diverse students, specifically children with disabilities (Sawhney, 2015; Singal, 2005).

Knowledge of Socio-Cultural Factors. In addition to pre and in-service education, an understanding of the socio-cultural factors related to the teacher and child also influences teacher pedagogy (Brown & Kraehe, 2010; Clarke, 2003; Devine, Fahie, & McGillicuddy,

2013; Kukari, 2004; Lonnquist, RB-Banks, & Huber, 2009; Milner, 2011; Moore, 2008), teachers' expectations and beliefs (Devine, Fahie, & McGillicuddy, 2013; Mohamed, 2014), and teacher's notions of teaching and learning (Kukari, 2004). Scholars have highlighted that teachers who take into consideration the cultural influences on their students will be more likely to use the differences to enhance instruction in the classrooms (Christensen, Wilson, Sunal, & Blalock, 2004; Gay, 2002; Moore, 2008; Stuart & Thurlow, 2000). Studies from other countries, namely China, Japan and Australia, have emphasized the importance of sociocultural considerations with specific regard to literacy instruction and development (Crozet, 2008; Lo-Philip, 2014; Oriyama, 2011), and students' academic success (Milner, 2011). The impact of sociocultural factors, including the economic situation, formal and functional constructs, social needs, social relationships and behaviour, and cultural and historical heritage, on literacy is greater for children living in rural areas than urban or suburban areas (Bonilla & Cruz-Arcila, 2014).

Specifically, in the Indian context, Clarke (2003) highlights the influence of hierarchy, where teachers are regarded as being superior in their understanding and thus hold greater power and influence than students. In India, a child's experiences and understanding are considered secondary to the community (Clarke, 2003). Additionally, studies have shown that educators in India regard meeting the needs of children with disabilities as a favor or compromise, rather than as a right (Kalyanpur, 2008b). Schools restrict the supplying of services for children with disabilities to modifications to school set-ups, such as including elevators or ramps (Singal, 2006), and fail to make modifications to the curriculum, and evaluation approaches (Sawhney, 2015). The lack of consideration of children with disabilities in mainstream classrooms often leads to the children being singled out, resulting in a lack of confidence, and aloofness (Sawhney, 2005). The results from a case study in India found that children with disabilities were restricted to the far end of the classrooms, and

failed to be part of peer groups during activities (Sawhney, 2005). Even though the Ministry of Human Resource Development (2015) has made inclusive education compulsory in the country, and requires all children to have equal access to schools, the current scenario does not lend itself to meeting its objectives, and instead is resulting in further desegregation (Sawhney, 2005). Since literature highlights how teaching practices are impacted by the teachers' knowledge of socio-cultural factors related to self and students (Bonilla & Cruz-Arcila, 2014; Clarke, 2003; Crozet, 2008; Lo-Philip, 2014; Oriyama, 2011), it necessitates that teachers become aware of the influence of such factors and are provided with further opportunities to introspect on the impact of these factors.

Teacher Beliefs

Beliefs are defined as a set of personal conceptual constructs that signify to its holder a reality (Fang, 1996; Pajares, 1992, as cited in Lee, Zhang, Song, & Huang, 2013). Pajares (1992) has referred to beliefs as "values, which house the evaluative, comparative, and judgmental functions of beliefs and replace predisposition with an imperative to action. Beliefs, attitudes, and values form an individual's belief system" (p.314). According to Borg (2011, p. 370) beliefs are "propositions individuals consider to be true and which are often tacit, have a strong evaluative and affective component, provide a basis for action, and are resistant to change". Further, Pederson & Liu (2003) has defined beliefs as mental constructions based on evaluation and judgment that are used to interpret experiences and guide behaviour. Thus, teachers' beliefs include the schemes about learning and teaching that they embrace as the truth. Further, it is suggested that teachers' beliefs include aspects related to learners, teachers, pedagogy, instructional related components, parents, and other areas of the organization (Tondeur, Devos, van Houtte, van Braak, & Valcke, 2009).

In India, the individual or medical model for disability continues to be predominant. This medical model views disability as residing within the individual (Sharma & Das, 2015).

As a result the diagnostic terminology for labeling individuals with disabilities becomes the language of choice for understanding behavioural and physical differences (Sharma & Das, 2015). On the one hand, labeling is seen as a means to provide services, but on the other hand it leads to locating students in subordinate positions to their peers. Furthermore, the predominance of the medical model populates teachers' thoughts and mediates their preferences as well as their dispositions to students with disabilities. The medical model puts the onus on the individual to fit in with society and leads teachers to focus their gaze on the deficits of students with disabilities (Sharma & Das, 2015). In some parts of India, the cultural perception to sometimes view disability as a 'curse' or a result of past deeds makes the individual responsible and hence viewed as a misfortune that cannot be changed (Alur, 2002).

Sharma, Morre, & Sonawane (2009) elaborate that the best way to change the attitude of the community towards persons with disabilities may be by ensuring that the teachers have positive attitudes. Bhatnagar & Das (2013) found a positive correlation between training received in special education and positive attitudes towards inclusive education. Furthermore, well-prepared teachers who are confident in their ability to cater for diversity within their classrooms are likely to have beneficial impact on the attitudes of students without disabilities towards their class fellows with disabilities. David & Kuyini (2012) in their study on inclusive classrooms in Tamil Nadu, India, found that teachers can make a difference in the social inclusion experiences of students with disabilities and that such inclusion are associated with increased peer interaction, greater learning opportunities and potentially better school outcomes for students with disabilities. Therefore the negative attitudes held by teachers towards inclusion are also likely to affect the attitudes of students without disabilities towards their peers with disabilities. Collectively this could influence interactional patterns in inclusive classrooms and thereby generate more or less social accepting classroom

conditions (David & Kuyini, 2012).

Teachers' beliefs are formed as a result of their personal and professional experiences (Riojas-Cortez, Alanis, & Flores, 2013; Tillema, 2000). Scholars have found the school environment to be more potent than pre-service teacher training in defining teachers' beliefs (Massengill, Mahlios, and Barry, 2005). However, further research in the field has suggested that in-service teachers with greater theoretical and practical pedagogical knowledge form their beliefs on their teaching experiences, whereas initial teachers' beliefs are more the result of their own experiences as students (Woolley, Benjamin, & Woolley, 2004). Currently, graduate teachers completing teacher education programs in India are exposed to education of children with disabilities through one or two theory-based subjects, which are often offered as optional subjects (Sharma & Das, 2015). This further creates a divide between special education teachers and general education teachers, leading to the implied notion that it takes special people to teach students with disabilities (Sharma & Das, 2015). Since a majority of teacher training institutes in India provide limited, if any, information about how to teach students with disabilities, the teachers are found to be resistant to the idea of including students with disabilities in their classrooms (Parsuram, 2006; Sharma et al., 2009). This is consistent with the results from other nations. In a comparative study that draws on samples from the United States, Australia, Canada and the United Kingdom, Mazurek (2011), revealed classroom teachers concerns and skepticism towards inclusive education due to a lack of professional development geared towards the same. Teacher's positive attitudes towards inclusion increased according to perceived adequacy of support. Monsen, Ewing, & Kwoka (2014) revealed that the teachers who feel inadequately supported are less likely to hold positive attitudes towards including pupils with special needs and are also less likely to provide classroom-learning environments suitable for all pupils.

In India, it is accepted that children need to comply with norms (Joshi, 2005), remain quiet, and not challenge authority (Yunus, 2005). As a result, there is a strong cultural expectation for children to conform to teachers, who are considered authority in the classroom (Clarke, 2003). This cultural expectation naturally translates into teacher education set-ups where teachers are expected to follow a more passive participatory stance, which diverges from constructivist teaching approaches.

The findings regarding the influence of teacher beliefs on student achievement are mixed across international contexts (Rashidi & Moghadam, 2014). A study on preschool children from low-income homes found the lack of a relation between the teacher's literacy and mathematics beliefs and their student's abilities (Brown, Molfese, & Molfese, 2008). Other studies, too, have failed to capture the correlation between teacher beliefs and the methods employed by teachers in the classrooms in Canada (Blotnicky-Gallant, Martin, McGonnell, & Corkum, 2015) in Hungary, Korea, Norway, and Turkey (Shi, Zhang, & Lin, 2014), and in the United States (Peabody, 2011). On the other hand, research has also revealed the influence of teacher beliefs on the instructional practices in the classroom (Lee, Zhang, Song, & Huang, 2013) and environmental set-ups in classrooms (Brighton, 2003). Additionally, the impact of teacher beliefs on teachers' instructional practices and student achievement was found to also hold true in mathematics through curriculum-based measurements (Polly et al., 2013). Even though there seems to be some inconsistency in the findings from different studies regarding the link between teacher beliefs and student's achievement as well as teacher beliefs and their instructional practices; increasing amounts of research tends to support teachers' beliefs of learning and teaching as being a significant component in determining teacher's classroom practices (Arce, Bodner, & Hutchinson, 2014; Carrington, Deppeler, & Moss, 2010; Díaz Larenas, Alarcón Hernández, Vásquez Neira, Pradel Suárez, & Ortiz Navarrete, 2013; Murphy et al., 2004; Pajares, 1992), with teachers'

constructivist beliefs having a more favorable impact than traditional beliefs (Arce et al., 2014; Hermans, Tondeur, van Braak, & Valcke, 2008).

Teacher Self-Efficacy. Teacher efficacy is defined as ‘‘beliefs in one’s capacity to organize and execute the courses of action required to produce given attainments’’ (Bandura, 1977; Hoy & Spero, 2005). Further it is defined as the teacher’s confidence in his/her ability to promote student learning (Bandura, 1977). There are four sources of teaching efficacy as highlighted in social cognitive theory, namely mastery experiences, vicarious experiences, social persuasion, and physiological states (Bandura, 1977). Teacher self-efficacy is considered an important factor, as it can have a bearing on the teacher’s persistence, passion, commitment, and teaching approaches (Goddard & Goddard, 2001; Tschannen-Moran & Hoy, 2001) and likely to therefore impact student achievement (Hines, Mack T., I.,II, 2008; Swackhamer, Koellner, Basile, & Kimbrough, 2009). Teacher efficacy has an impact on behaviour due to changes in cognitive, motivational, and affective processes (Bandura, 1977).

An assortment of studies has revealed the effects of teacher self-efficacy specifically on student’s literacy skills (Guo, Connor, Yang, Roehrig & Morrison, 2012; Tschannen-Moran & Hoy, 2001). Specifically, teacher’s self-efficacy is shown to influence teacher’s classroom practices, which in turn affect student outcomes. For instance, in one study, Guo et al. (2010) found that teacher’s increased self-efficacy led teachers to provide students with increased support through encouraging interactions in the classroom. This impact of high teacher efficacy on classroom practices was instrumental in positively influencing student’s achievement. Hence, teacher’s efficacy is seen to indirectly influence student outcomes. Other researchers have confirmed the positive impact of teacher’s efficacy on student’s literacy achievement through a direct route as well (Gibson & Dembo, 1984).

Researchers have also highlighted that teachers with high self-efficacy believe that they can affect student performance, including students who are academically poor, and

defiant (Guskey and Passaro, 1994). Further, teachers with high efficacy beliefs are able to support and adequately meet the needs of students with learning difficulties (Gibson & Dembo, 1984). Brownell & Pajares (1999) assert that teachers with high efficacy beliefs are more likely to provide accessible accommodations for students with disabilities or other difficulties, and as a result, are more likely to impact student achievement more positively. Other research has also confirmed that teachers with high self-efficacy have positive repercussions on students' academic performances, even those with special needs (Shani & Hebel, 2016). Further, this influence of high teacher efficacy on student outcomes is attributed to the teachers' effective and positive approaches towards the students as compared to teachers with low efficacy (Paneque & Barbetta, 2006).

These findings were further validated in the results from a study that showed teacher efficacy had an impact on poorly performing, disruptive students in the classroom (Ashton & Webb, 1986). Specifically, the results of the study demonstrated that teachers with low efficacy tended to ignore the lower ability students in the classroom. On the other hand, the teachers with high efficacy viewed poorly performing students more positively while regulating with these children better, and having higher expectations regarding academic performance, leading to improved student outcomes (Ashton, Webb, & Doda, 1983). With regard to special education teachers of English Language Learners with disabilities, the results of a study revealed that teacher's proficiency with the student's language was positively related to teacher efficacy (Paneque & Barbetta, 2006).

School Environment

Teacher Turnover. Teacher turnover has an undesirable impact on instructional practices within a school, as turnover results in lack of consistency, and the discontinuation of instructional routines and failure to reform existing practices with new teachers (Guin, 2004; Khawary & Ali, 2015). The lack of continuity in teacher instruction leads to students

receiving a "less comprehensive and unified instructional program" (Guin, 2004, p. 19). Further, research from diverse geographic school contexts (e.g. Turkey, London, New York City, and Afghanistan) reveals an inverse direct relationship between high teacher turnover and low student achievement (Ronfeldt, Loeb, & Wyckoff, 2013; Dolton & Newson, 2003). Specifically, high teacher turnover has an unfavorable influence on student learning (Allensworth, Ponisciak, & Mazzeo, 2009; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2008; Khawary & Ali, 2015; Rivkin, Hanushek, and Kain 2005; Watlington, Shockley, Guglielmino, & Felsher, 2010), as it requires students to make continuous adaptations with novice teachers, including behavioural accommodations (Khawary & Ali, 2015). Lastly, high teacher turnover leads to increased costs to schools, and results in disruptions in the learning process as the quality of school community and performance is hampered, and hence it effects student performance (Allensworth et al., 2009; Guin, 2004; Ingersoll, 2001; Ronfeldt et al., 2013).

Lack of school resources. Analyses from surveys and research across schools in different contexts, including Latin America, Australia, Netherlands, and China have demonstrated a direct relationship between the resource accessibility in schools and student achievement (Du & Hu, 2008; Haelermans, De Witte, & Blank, 2012; Murillo & Roman, 2011; Sullivan, Perry, & McConney, 2013). Literature studies have specifically highlighted the significance of certain resources, namely, infrastructure and basic facilities, including water, electricity, sewage, labs, libraries, sports, and computers, in effecting student performance (Murillo & Roman, 2011). In addition, studies also demonstrate that students' scores in different subjects were higher when they belonged to learning centers with adequate facilities, including a variety of teaching and educational materials, as compared to students who were from centers with inadequate facilities in urban (Priti, Tyagi, & Kumar, 2015) and rural (Chudgar, Chandra, Iyengar, & Shanker, 2015) India, as well as other international

contexts (Savasci & Tomul, 2013). Literature has also demonstrated evidence for the link between the availability of resources, specifically instructional and curriculum materials, and teacher instruction (Bishop et al., 2010). Research reveals that access to curriculum materials helps teachers facilitate instructions by providing the appropriate context, rectifying misconceptions, and supporting students in relevant activities (Hill & Charalambous, 2012).

Class Size. Various empirical studies have sought to determine the influence of the class size on student success (Bosworth, 2014; Clanet, 2010; Funkhouser, 2009; Gupta, 2004; Jepsen & Rivkin, 2009). Even though a smaller class size provides increased attention to students and increased opportunities for interaction (Blatchford, Bassett, & Brown, 2011), empirical studies have failed to provide conclusive results regarding the relationship between a smaller class size and increased student achievement (Bosworth, 2014; Clanet, 2010; Funkhouser, 2009; Gupta, 2004). Literature has demonstrated both, a positive relationship between reduced class sizes and increased student achievement (Clanet, 2010; Jepsen & Rivkin, 2009), as well as between improved student learning and engagement in large classroom sizes (Gupta, 2004; Watts & Georgiou, 2008). Moreover, studies have shown the positive impact of smaller classrooms on student's performance across different subjects, namely, reading, listening and word recognition skills, only in lower grades, specifically up to the fourth grade (Shin & Raudenbush, 2011). Further, studies are also inconclusive about the negative impact of bigger classes on low-ability student's achievement, with some research demonstrating a significant effect (De Paola, Ponzo, & Scoppa, 2013), while others fail to reveal an influence of class size for children with more significant needs (Zarghami & Schnellert, 2004). Yet, literature has shown that reduced class sizes are more effective at bridging the achievement gaps among students (Bosworth, 2014).

With regard to the link between class size and classroom instructions, the conclusions from different studies is also mixed. Some studies favor large classrooms to enable improved

teacher instructional practices like technology integration for student engagement (Francis, 2012), whereas other studies have revealed the positive effect of smaller classes on teacher's instructions due to minimal behavioural issues, increased time for individualized instruction, enhanced strategy use, and greater content coverage (Halbach, Ehrle, Zahorik, & Molnar, 2001). Still other research has failed to demonstrate the effect of class size on teaching instructions (Clanet, 2010). Even though the impact of class size on teachers' and students' performance continues to remain debatable, a study on inclusive schools in India revealed that large class sizes restricted the teachers' ability to provide for the needs of all children adequately (Sawhney, 2015).

Home Literacy Environment

Home literacy environment is defined as an interactive experience that occurs across multiple contexts and is frequently referred to as a key component in emergent literacy acquisition (Schmitt et al., 2011; Wood, 2002, as cited in Frechette, 2013, p. 4). Bronfenbrenner's (1979) ecological system theory postulates five systems at different levels nested within one another, impacting development. One of these, the microsystem includes the actions and direct interactions in the child's immediate environment (Neal & Neal, 2013). Therefore, in addition to factors related to the teacher and school environment, the child's achievement is likely to be impacted by another significant factor - the home literacy environment (HLE). The home literacy environment includes a range of components, such as parents' reading activities, the availability of books, library visits, and accessibility of literacy materials.

While literature regarding the home literacy environment in India is scarce, research has revealed that book reading at home was correlated positively with the child's literacy gains (Bruns & Pierce, 2007; Kalia & Reese, 2009; Lawson, 2012). A number of other studies in myriad settings involving different populations, including toddlers in Portugal

(Pinto, Pessanha, & Aguiar, 2013), native and ethnic minority families in Netherlands (van Steensel, 2006), African-American, low-income families (Roberts, Jurgens, & Burchinal, 2005), Chinese ESL kindergarteners (Yeung & King, 2016) preschool children with language impairment (Sawyer et al, 2014), Latino immigrant families (Farver, Xu, Lonigan, & Eppe, 2013), and others (Sénéchal & LeFevre, 2014) have provided evidence for the positive impact of the home literacy environment on the child's comprehension skills. Furthermore, the significance of the home literacy environment for English comprehension can be seen across different aspects within the home literacy environment and multiple international contexts. A positive link is reported between parents' rate of reading-related behaviors and their children's reading capacities (Silinskas et al., 2012), and between parent-child interactions that are literacy-based and children's skills in language (Bruns & Pierce, 2007; Liebeskind, Piotrowski, Lapierre, & Linebarger, 2014). Hence the significance of the home literacy environment in the development of children's linguistic competencies is well established in literature (Niklas & Schneider, 2013).

Conclusion

As seen above, a range of factors related to teacher pedagogy, teacher beliefs, classroom environment, home environment and government funding encompass the problem regarding low comprehension achievement of students. Even though teacher pedagogy in India is undergoing a shift from the earlier ideologies based in colonial British policies and Ancient Indian beliefs to more learner focused ones (Gupta, 2015), the current scenario of pre-service teacher training fails to support readiness of teachers for the diverse classrooms (Das et al., 2013; Saravanabhavan & Saravanabhavan, 2010). Further the problem is aggravated due to the insufficiency of support to teachers within schools through necessary in-service training (Hodkinson & Devarakonda, 2009). Additionally, teacher's instructional practices are impacted by their beliefs (Kukari, 2004; Koutselini & Persianis, 2000; Moore,

2008; Taskin-Can, 2011) and their self-efficacy (Tschannen-Moran & Hoy, 2001), which in turn impact student's comprehension skills (Guo et al, 2012). Another crucial element, knowledge of the socio-cultural factors is shown to impact teacher pedagogy (Brown & Kraehe, 2010; Clarke, 2003), as well as teacher beliefs (Devine et al., 2013), and hence must be considered here.

Besides factors related to teachers, there are a number of aspects with regard to the school environment that also have a bearing on the problem. Teacher turnover is significant as it is negatively correlated with student achievement (Ronfeldt et al., 2013; Dolton & Newson, 2003). There also exists a positive link between availability of school resources and student achievement (Du & Hu, 2008; Haelermans et al., 2013). However, the smaller class size, as assumed, is not correlated with increased attainment of students (Gupta, 2004). With regard to aspects related to the home environment, studies from India (Kalia & Reese, 2009) as well as other contexts (Pinto et al., 2013; Roberts et al., 2005; Yeung & King, 2016) have conclusively led to the finding that a literacy rich home environment would influence the child's comprehension skills. Lastly, the lowered government expenditure on education in India (The World Bank, UNESCO) is bound to impact a host of other factors, such as, teacher training, availability of resources in schools, and teacher turnover within the context.

The factors that will be considered in the needs assessment will include teacher pedagogy, pre and in-service teacher education, teacher's knowledge regarding the socio-cultural aspects of the child, teacher beliefs and efficacy, teacher turnover, and the student's home literacy environment. The implications of inadequate school resources, though notable with regard to its influence on students' comprehension outcomes will not be considered within the current study, as resources are abundantly available and supplied for by the school management within the context. Likewise, even though overcrowding in classrooms is a significant factor that could impact teaching practices and result students' English

comprehension achievement scores, this factor is not noteworthy in the context of the study, given the small class sizes, with a maximum of 11 students per class.

CHAPTER 2 – EMPIRICAL EXAMINATION OF THE FACTORS AND UNDERLYING CAUSES

Introduction

The literature review highlights the various factors related to the current problem of practice. Specifically, the review included research related to the impact of the family microsystem, namely the home literacy environment on student achievement. Additionally, the research also encompassed the effect of the school microsystem that is factors related to the teacher, including teacher pedagogy and teacher beliefs on student achievement. Also, the impact of other factors related to the school microsystem, such as teacher turnover, lack of school resources, and overcrowded classrooms on student achievement were examined as well. Lastly, the influence of a macrosystem, namely government funding, on student achievement was also reviewed. The objective of the needs assessment is to explore the influence of teacher and home factors on students' poor comprehension achievement within this context. Specifically, this exploration includes the factors of teacher pedagogy, pre and in-service teacher education, teacher's knowledge regarding the socio-cultural aspects of the child, teacher beliefs and efficacy, teacher turnover, and the student's home literacy environment.

Context of the study

The students' low comprehension achievement results are evident within the context of a special need private school in an urban setting located in Mumbai, India. Low reading comprehension scores are evident by students' scores on the Comprehensive Assessment of Reading Strategies (CARS) test. All the students' comprehension scores were lower than their current grade level, with the range being between one to eight grade levels lower. Furthermore, this problem is significant, as student comprehension achievement seems to be

impacting student's performance in other academic areas like math, humanities, and science, as evidenced by teacher's comments regarding their ability to read and write (Shah, 2016).

The students within the context range from 9 to 17 years of age and come from diverse socio-economic backgrounds. In addition, they have diverse disabilities including Learning Disabilities (LD), Autism Spectrum Disorder (ASD), Cerebral Palsy, Attention Deficit Hyperactivity Disorder (ADHD), Down Syndrome, Fragile X, and others.

The teacher population includes individuals with and without teacher education and teaching experience. Three of the teachers have been teaching at the school for the past one year, whereas one teacher has been teaching for the past two years. Two of the teachers have had prior teaching experiences, one for thirty years and the other for two years. The other two teachers have had no teaching experience. According to Vijaysimha (2013), pre-service teacher education in India does not adequately prepare teachers for classroom planning and instruction resulting in teachers entering schools with huge knowledge gaps in planning, instruction, and classroom management. The school in context provides a compulsory in-service teacher training program for all teachers. This program, including a one-month long summer session and designated days throughout the year, focuses on evidence-based teaching strategies and tools, pedagogical knowledge, and content related to specific subjects.

Statement of Purpose of Study

The current problem is that diverse student learners in the school under study are demonstrating low English comprehension achievement and show little improvement over time. Some of the underlying factors to this problem that will be considered include factors related to the teacher and the student's home. Therefore, the purpose of this study is to understand the teacher and home underlying factors associated with low comprehension achievement among diverse students in the special needs education school in Mumbai, India. As such, data were collected on the various factors previously stated in order to study their

effect on the problem of practice as well as the relationship between the various factors. The research questions guiding this study are as follows,

1. To what degree does teacher pedagogy relate to low English comprehension achievement for students with diverse learning needs?
2. How is teacher pedagogy influenced by a) teacher's beliefs about effective teaching qualities, the role of collaboration, and knowledge of students' sociocultural background, and b) teacher education (pre-service and in-service)?
3. To what extent do teachers' beliefs about teaching and their self-efficacy influence students' English comprehension achievement?
4. What is the strength and direction of the relationship between students' home literacy environment and English comprehension achievement?

Method

Research Design

This study relied on mixed-methods research involving the use of quantitative and qualitative methods and the integration of the two (Johnson & Onwuegbuzie, 2004). The mixed method design – the convergent parallel design, allows for triangulation, that is greater convergence and correspondence of the results from the different methods used (Creswell & Plano Clark, 2011). Further, the mixed methods convergent parallel design lends itself to achieve elaboration and enhancement of the results from the quantitative methods with the results from the qualitative methods, and hence achieve complementarity of results (Creswell & Plano Clark, 2011). The quantitative methods used in this study included surveys administered to students, parents, and teachers. The qualitative methods employed included in-depth interviewing and participant observations of teachers.

Participants.

Students. The participants for this study included students (n = 24) from a special

education needs school located in Mumbai, India (Table 2.1). Seventy-five percent of the sample were male and 25% were female. Students ranged in age from 9 to 17 years. Nearly 36% of the student sample were between the ages of 9 to 11 years, 33.3% were between 12 to 14 years, and 29.17% were 15-17 years old.

The students' families can be categorized as coming from diverse socio-economic backgrounds based on their capacity to pay the school's academic fees. The student's were categorized into three groups based on their socio-economic status, a) low, signifying that these students were getting a scholarship and did not pay any school fees, b) middle, denoting that these student's families pay 50% of the school fee, and c) high, indicating that these student's families pay the entire school fee for each academic year. Nearly 12.5% of the students came from a low SES background, 62.5% students came from a middle SES background, and 25% of the students came from a high SES background.

Teachers. Table 2.2 represents the teacher participants in the study. At the start of the needs assessment, the sample included four female teachers who had been teaching English language at the school for a minimum period of one year. One of the teachers had completed her undergraduate degree in special education, one had a postgraduate degree in special education, one had a bachelors degree in psychology with a diploma in special education, and one teacher had no degree in education, but an undergraduate degree in interior designing. Three of the teachers had been teaching at the school for one year, whereas one teacher had been teaching for two years. Two of the teachers had prior teaching experiences, one for thirty years and the other for two years. The other two teachers had no prior teaching experience.

During the second part of data collection, five additional female teachers were added in the study. All the teachers were English language teachers at the school for two to four months. One teacher had no degree in education, one had completed her bachelors in special

education, one had a master's degree in counseling psychology, one a diploma in education, and one had finished her post graduation in special education. Two teachers had previous teaching experiences for two to three years, whereas three teachers had no earlier experiences in teaching.

Parents. A sample of 30 parents participated in the study. Approximately 5% of the parents were legal guardians of the students, having adopted them at infancy. The parents came from differing socio-economic and educational backgrounds.

Table 2.1:

Student demographics by age, socioeconomic status, and gender

Variable	%
Age	
9 – 11 years	36%
12 – 14 years	33.3%
15 – 17 years	29.17%
Socioeconomic Status	
Low SES	12.5%
Middle SES	62.5%
High SES	25.0%
Gender	
Male	75%
Female	25%

Table 2.2:

Teacher education demographics

Variable	N
Prior Education	
No degree in education	2
Diploma in education	1
Bachelors in Special Education	2
Bachelors in Counseling Psychology	1
Masters in Special Education	2
Masters in Counseling Psychology	1
Prior Teaching Experience	
No prior experience	5
2 years experience	3
30 years experience	1

Measures and Instrumentation

Teacher Turnover. Ingersoll (2001) refers to teacher turnover as the movement of teachers from schools and classifies this further depending on the teacher's next jobs. Teacher attrition refers to those teachers who quit the teaching profession completely, also referred to as "leavers". Teacher migration refers to teachers who shift to other schools for other teaching jobs and are also referred to as "movers" (Ingersoll, 2001, p. 508). In this study, teacher turnover will be defined as teachers, both the "leavers" and "movers", who leave their current job at the end of an academic year.

Diverse Learners. In this study, diverse learners are defined as the differences observed among students in three different areas, namely, readiness, interest and learning profiles (Tomlinson, 2001). The instrument used for this construct was the Learning Profile Questionnaire by Denise Murphy and Beth Ann Potter (Tomlinson, 2001, p. 70). It includes 20 questions with a 7-point scale ranging from 1 (completely disagree) to 7 (completely agree). The questionnaire is attached as Appendix A.

English Comprehension Achievement. Comprehension is the ability to construct meaning from text, and constitutes the purpose for reading (Armbruster, Lehr, & Osborn, 2001). Snow (2002) defines reading comprehension as the process of simultaneously extracting and constructing meaning through interaction and involvement with written language. The three aspects included in comprehension are (1) the reader who is doing the comprehension, (2) the text that is to be comprehended, and (3) the activity in which comprehension is a part. For this study, English comprehension achievement is defined as the extent of improvement or progress made by a child over a one-year period, based on the student's scores generated from the Comprehensive Assessment of Reading Strategies (CARS) assessment tool conducted three times in the year in the school. The CARS series is used to identify and assess a student's level of mastery for a range of reading strategies for

students in grades K through 8. This reading comprehension assessment uses a multiple-choice format for the following 12 reading strategies; (1) finding main idea, (2) recalling facts and details, (3) understanding sequence, (4) recognizing cause and effect, (5) comparing and contrasting, (6) making predictions, (7) finding word meaning in context, (8) drawing conclusions and making inferences, (9) distinguishing fact from opinion, (10) identifying author's purpose, (11) interpreting figurative language, and (12) summarizing.

The reliability of the scale is confirmed with intraclass correlation coefficient and the Cronbach's α computed was .791. The scale has high face validity, as comprehension questions in multiple-choice methods are the most common method used in reading comprehension assessments (Andreassen & Braten, 2010; Ozuru, Best, Bell, Witherspoon, & McNamara, 2007). The tests using a multiple-choice format usually provide readers with three or more response options, with variation in text length, text questions, and text availability (Andreassen & Braten, 2010).

Teacher Pedagogy. Teacher pedagogy is described within the framework for teaching grounded in a constructivist view of learning and teaching, namely, The Framework for Teaching (Danielson, 2013). This framework was introduced in 1996, and "identifies those aspects of a teacher's responsibilities that have been documented through empirical studies and theoretical research as promoting improved student learning" (Danielson, 1996, p. 1). It is "based on the Praxis III criteria developed by the Educational Testing Service (ETS) after extensive surveys of the research literature, consultation with expert practitioners and researchers, wide-ranging job analyses, summaries of the demands of state licensing programs, and fieldwork" (Danielson, 2007, p. 183). Danielson (2007) explains that a constructivist perspective towards teaching and learning inspires this framework.

This framework utilizes four broad domains, namely, planning and preparation; classroom environment; instruction; and professional responsibility; broken down into 22

components and 76 smaller elements to incorporate the variety of components related to teaching. For this study, teacher pedagogy will be measured using only the first three domains, including 16 components. Each component of the instrument has a detailed rubric that is used to evaluate the teachers on the elements as *unsatisfactory, basic, proficient,* or *distinguished*. A list of the relevant components for each of three domains, along with the observed data, is delineated in the Framework for Teaching Observation Sheet in Appendix B.

The validity of the instrument is demonstrated in different research studies that found teacher practices, measured by teacher evaluation system based on the Framework for Teaching (Danielson, 1996) lead to student achievement. For instance, a study in a large Western school district provided evidence for a statistically significant positive correlation between teacher performances, as measured by the evaluation system based on the Framework for Teaching (Danielson, 1996), and student achievement (Kimball, White, Milanowski, & Borman, 2004). The positive relationship between teacher evaluation scores and student achievement was further confirmed in another study that evaluated teachers based on a subject-specific adaptation of the Danielson (1996) Framework for Teaching (Gallagher, 2004). Additionally, small to moderate correlations were demonstrated between teacher evaluation scores based on a set of teaching standards rooted in the Framework for Teaching (Danielson, 1996) and student achievement with 0.27 in science, 0.32 in reading, and 0.43 in mathematics (Milanowski, 2004). Additionally, another instrument, The University Supervisors Evaluation Report (USER) was developed based on 22 components in the 4 domains of Danielson's framework. When evaluated in relation to the Danielson's framework, the USER demonstrated high internal consistency reliability within each domain, and high content validity and construct validity (Benjamin, 2002).

Teacher observations, that include measures of observable classroom processes, such as specific teacher practices, holistic aspects of instruction, and interactions between teachers and students are considered one of the most widely forms of teacher evaluation (Goe, Bell, & Little, 2008; Pianta & Hamre, 2009). Additionally, evidence based teacher evaluation systems include multiple time points for classroom observations, use of rubrics that define instructional improvement on a continuum, links teacher effectiveness to student performance, and demonstrates variation in performance ratings among teachers (Goe et al., 2008). Hence the Danielson instrument used for teacher evaluation in this study, an observational protocol, has high face validity as it incorporates the above-mentioned aspects of evidence based teacher evaluation systems.

Knowledge of Child's Socio-cultural Background. Socio-cultural factors are belief and value system, attitudes, acculturation levels, socialization goals and practices, language use at home, etc. that affects the thoughts, behaviors and feelings of individual members of those societies and cultures (Gonzalez, 2001). In this paper, the construct is considered to the extent that the teacher deems the child's socio-cultural background, including information about his/her language, aesthetics (appearance), religion, values, attitudes, social organizations, family, community, role or status among others, essential with regard to teaching. Data for this construct was collected during the interviews with the teachers. Some questions included in the interview were "Do you deem knowledge about the child's socio-cultural background, including information about his/her language, aesthetics (appearance), religion, values, attitudes, social organizations, family, community, role or status among others, essential with regard to your teaching? (follow-up) Why or why not?" and "In what ways do you think the knowledge about the child's socio-cultural background would influence your teaching practices?" The interview questions are in Appendix F.

Teacher Collaboration. For the purpose of this study, collaboration is defined as teams of teachers who work interdependently to achieve common goals — goals linked to the purpose of learning for all — for which members are held mutually accountable (Dufour, DuFour, Eaker, & Many, 2010). Data was collected using interviews (see Appendix F) regarding the extent to which teachers consider this factor crucial to teaching. Example interview questions included "Do you consider collaboration between teachers within the school an essential component? Why?" and "How would collaboration between teachers impact your effectiveness as a teacher?"

Teacher Education. Pre-service teacher education is considered to be the period spent in acquiring a basic repertoire for teaching, and "helping teacher candidates figure out when, where, how, and why to use particular approaches (Feiman-Nemser, 2001, p. 1019). Hence, during pre-service teacher education, teachers are exposed to different curricular matter, general and subject specific models of teaching, and a wide range of assessment and evaluation tools (Feiman-Nemser, 2001). Most preservice teacher education programs include a four-year university training period during which they acquire the necessary certification and preparation to teach (Markelz, Riden, & Scheeler, 2017). Hence, pre-service training would include any degree, diploma, or certificate courses in Education or Special Education from any institute or university in India or around the world. In-service teacher education includes "work-related learning opportunities for practicing teachers" that result in "transformation in teacher's knowledge, understandings, skills, and commitments" so as to enhance their individual and collective practice within a community (Feiman-Nemser, 2001, p. 1038). This construct was examined by aiming to understand the degree that teachers considered it significant to shaping their current teaching practices. The data were collected from the teachers using interviews ("How has that education contributed to your ideas about teaching, specifically with regard to planning?" and "How has that education contributed to

your ideas about teaching, specifically with regard to instruction and classroom management?"). The interview questions are in Appendix F.

Teacher Beliefs. Beliefs are defined as a set of personal conceptual constructs that signify to its holder a reality (Fang, 1996; Pajares, 1992, as cited in Lee et al., 2013). Teacher beliefs influence teacher's decision-making in the classroom and drive their instructional pedagogy (Fang, 1996; Pajares, 1992; Richardson, 1996). In this study, this construct was operationalized through the Teacher Beliefs Scale (TBS) Questionnaire, based on an extensive literature review related to the behaviorist and constructivist theories (Woolley, Benjamin, & Woolley, 2004). More specifically, this scale was used to assess the beliefs of teachers related to constructivist and traditional approaches to teaching and learning (Woolley et al., 2004). It contains 21 items in three constructs, namely, Traditional Management (TM). Traditional Teaching (TT), and Constructivist Teaching (CT), and uses a 6-point rating scale ranging from 1 (strongly disagree) to 6 (strongly agree). The reliability and validity of the scale are confirmed by Woolley (2004) with Cronbach's alpha reliability coefficients for different constructs (n=896) as, Traditional Management (.52), Traditional Teaching (.78), and Constructivist Teaching (.73). Cronbach's α computed from the factor analysis of the survey's scale items was .78. A correlation analysis between scales was used to assess the construct validity. Results from the analysis indicated positive correlations between the different traditional teaching scales while a negative correlation was found between traditional and constructivist descriptors. The survey is presented in Appendix C.

Teacher Self-Efficacy. Self-efficacy is defined as the teacher's confidence in his/her ability to promote student learning (Bandura, 1977). This construct was examined using the 12-item short-form of Teacher Sense of Self-Efficacy instrument (Tschannen-Moran & Hoy, 2001) was used as a measure of the construct in this study. In this scale, three moderately correlated factors for teachers' efficacy has been consistently found in Student Engagement,

Instructional Practices, and Classroom Management. The survey has the reader answer a total of twelve items on a 9-point Likert scale, with one indicating nothing and nine indicating a great deal. It is considered a reliable and valid instrument, with alpha coefficients for the overall scale being .90, and for different factors as .81 (Student Engagement), .86 (Instructional Practices), and .86 (Classroom Management). The survey can be found in Appendix D.

Home Literacy Environment. Home literacy environment is defined as multifarious interactive experience that occur across multiple contexts and is frequently referred to as a key component in emergent literacy acquisition (Schmitt et al., 2011; Wood, 2002, as cited in Frechette, 2013, p. 4). The Home Literacy Environment Questionnaire (Umek, Podlesek, & Fekonja, 2005, see Appendix E) measured the home literacy environment in this study. It is a parent report measure with 33 items that assesses various elements of the HLE. The questionnaire includes a 6 point Likert scale with responses ranging from 1-2 = never or rarely, 3-4 = frequently, 5-6 = very frequently or always. A higher score on each of the factors indicates s higher quality of a child's home literacy environment. This measure has high reliability, and significant construct validity when examining the role that HLE plays in the linguistic development of 4- year-olds (Umek et al., 2005). The reliability coefficients of the five factors are relatively high ($\alpha = 0.77$ to 0.85 for different factors) with correlations ranging from 0.19 to 0.61 between different factors.

Procedure

Teacher Turnover. The data regarding the teacher turnover obtained from the school records was used to determine the percentage of teachers who left at the end of the academic year 2015-2016.

Diverse Learners. The Learning Profile Questionnaire was administered in a one on one setting with 20 students in the school. The data was tabulated and the standard deviation

for each of the 20 items in the questionnaire was calculated. This was done to determine the items that had the highest standard deviation, and thus the corresponding areas that student were most differentiated in, thus demonstrating diversity in their learning profiles.

English Comprehension Achievement. CARS test administered three times during 2015-2016 school year for a total of 46 students were collected from the school data records. The data for each student was arranged in three columns, pretest (beginning of the year), benchmark (middle of the year), and posttest (end of the year). The data was plotted on a histogram to check for the normal distribution of scores. Following this, a repeated measures ANOVA was used to determine if there were statistically significant differences across the time points. In addition, a follow-up Helmert post hoc analysis examined differences between the means from the beginning to middle of the year, from middle to end of the year, and from beginning to end of the year. The results were evaluated using an alpha of .05.

Teacher Pedagogy. The researcher first evaluated four language teachers' performance over 60 minute lessons using the first three domains; planning and preparation, classroom environment, and instruction; of the Framework for Teaching evaluation system (Danielson, 1996). Each teacher's average score for each indicator (Unsatisfactory, Basic, Proficient, Distinguished) across the 16 components on the framework was measured. These scores were compared to the students' average percentage increase in scores to describe if there exists a relational pattern between teacher pedagogy and increases in student achievement. Further, teachers' evaluations on the different components of the framework were analyzed to determine common trends in responses. For instance, the data was examined to reveal the percentage of teachers who were evaluated as "proficient" on a particular domain. Later, five additional teachers were evaluated on the same three domains of the Framework for Teaching evaluation system (Danielson, 1996) after 60-minute lesson observations. The teacher's score on each indicator (Unsatisfactory, Basic, Proficient,

Distinguished) across the 16 components of the framework was calculated. In addition, the data was examined to reveal trends across the responses.

Knowledge of Child's Socio-cultural Background, Collaboration among teachers, Teacher Education, and Teacher Challenges. Each of the four language teachers was interviewed individually for approximately 45 minutes and recorded by the researcher. After the interview, the researcher transcribed the teachers' responses and recorded the different responses in a tabular format for each question. First, codes for each teacher were highlighted. For instance, some of the emergent codes elicited from one teacher included "teacher pedagogy", "differentiate", "openness to learning", "explicit instruction model", "minimal influence of education", "lifelong learner", "growth mindset", "wider resources". Then the researcher looked for common codes across questions and teachers and elicited broader themes. One theme that emerged across questions and teachers was "Differentiate". These themes were then related to teachers' pedagogy by checking the teacher's evaluation on the appropriate components. For instance, the teacher's pedagogy related to the components "demonstrate knowledge of content and pedagogy" and "demonstrate knowledge of students" was checked to determine if the indicators reflect challenges as revealed in the theme "Differentiate" from the interview data. The additional five teachers added in the needs assessment went through a similar process, with the researcher recording and then transcribing the 45-minute interview. The codes identified from the interviews with the previous four teachers were then used to analyze the other five teachers' responses.

Teacher Beliefs. The data for each of the four teachers first included in the needs assessment was arranged according to the items that defined the traditional approach (Items 1, 11, 12, 20, 5, 6, 8, 9, 15, 17, 19) and items that belonged to the constructivist approach (Items 2, 3, 4, 7, 10, 13, 14, 16, 18, 21). An average score for each of the four teacher's traditional and constructivist approach was calculated and compared to determine which teacher

exhibited a more traditional or constructivist approach. The four teacher's scores were then compared to their student's average percentage increase in scores to describe descriptively if a relationship existed between the two variables. For the additional five teachers added to the needs assessment, the data was likewise arranged into items delineating the traditional approach (Items 1, 11, 12, 20, 5, 6, 8, 9, 15, 17, 19) and items describing the constructivist approach (Items 2, 3, 4, 7, 10, 13, 14, 16, 18, 21). The difference between the scores was used to determine each teacher's approach (traditional or constructivist).

Teacher Self-Efficacy. The teacher's responses on the survey were listed for each teacher in columns and the average efficacy score for each teacher was calculated. These scores were disaggregated by teacher and compared to the students' average percentage increase in scores to describe if there exists a relation between teacher self-efficacy and increases in student achievement.

Home Literacy Environment. The parent's responses on the survey were listed for each parent in columns and the average score for each parent was calculated. These scores were compared to the students' average percentage increase in scores to describe if a relational pattern existed between students' home literacy environment and increases in student achievement.

Plan of Action. In the study, initially, a sample of four teachers was included. The researcher evaluated teacher pedagogy using the Framework for Teaching evaluation system (Danielson, 1996), interviewed each teacher individually to obtain data about their knowledge of the child's socio-cultural background, information about collaboration among teachers, teacher education, and teacher challenges, and administered the Teacher Beliefs Scale (TBS) Questionnaire (Woolley et al., 2004) and Teacher Sense of Self-Efficacy instrument (Tschannen-Moran & Hoy, 2001) to obtain data about teacher beliefs and teacher self-efficacy respectively. Further, the teachers' data was analyzed along with the

corresponding average percentage increase of students' comprehension scores generated from the Comprehensive Assessment of Reading Strategies (CARS) assessment tool. At a later point in the study, five additional teachers were included in the sample. Similar, to the earlier sample, the researcher evaluated teacher pedagogy, interviewed the teachers, and administered the belief survey with the five new teachers. Based on findings of a positive correlation between teacher beliefs and students' comprehension scores from the initial sample of four teachers, inferences were made regarding student achievement scores for the additional five new teachers included in the study.

Findings and Discussion

The purpose of this study was to understand the underlying factors associated with the low comprehension achievement among diverse students in the special needs education school in Mumbai, India. As such, the researcher aimed to determine if there exists a relationship between teacher pedagogy and students' comprehension achievement; between teacher beliefs and increases in student achievement; between teacher self-efficacy and increases in student achievement; and between students' home literacy environment and their comprehension achievement. The data obtained at the school revealed that the current teacher turnover rate is rather large, approximately 40% for the academic year 2015-2016.

English Comprehension Achievement

The student's scores on the CARS test for the pretest, benchmark, and posttest and the percentage difference between the pre and posttest reveal that the CARS data was normally distributed (Table 2.3). The histogram representing the normal distribution of scores is represented in Figure 2.1. The results from the ANOVA showed a statistically significant difference between students' comprehension scores and from the beginning, middle, and end of the year $F_{2,92} = 23.04$, $p < .001$. The follow-up Helmert post-hoc analysis demonstrated statistically significant differences between the student's scores from the beginning

(M=50.48) to the middle (M=59.49) of the year $F_{1,92} = 33.99$, $p < .001$, from the middle (M=59.49) to the end (65.78) of the year $F_{1,92} = 11.53$, $p < .005$, and from the beginning to the end of the year $F_{1,92} = 46.25$, $p < .001$.

Contrary to the problem of practice, the data demonstrated an increase in student's comprehension scores over the course of one academic year. However, even though students' comprehension scores have exhibited a significant increase over the year, these results must be viewed in light of the levels used to assess the student's comprehension scores. The sample of students performed one to eight grade levels lower than their current grade level on the CARS Test (Table 2.4). Approximately 42% were eight grades below level. Furthermore, 4.17% were seven grade levels lower, 4.17% were six grade levels lower, 16.67% were five grade levels lower, 8.33% were four grade levels lower, 25% were three grade levels lower, 20.83% were two grade levels lower, 12.5% were one grade level lower, and 4.17% of the students were at grade level. As such, the vast majority of students took the assessment at a level that was lower than their current grade level, with the range being between one to eight grade levels lower.

The significant increase in students' scores over the year revealed by ANOVA may not be an accurate reflection of their true comprehension achievement. Instead it may actually reflect their progress on the level of the test that they completed. Further, the students' increase in comprehension scores was demonstrated on the same grade level used at the beginning of the year, and none of the students' increases in scores led to students moving to a higher grade by the end of the year.

Table 2.3:

The average pre-test, benchmark, and post-test scores for 46 children and the percentage difference between pre and post test on CARS test

Pre-test score	Benchmark score	Post-test score	Percentage difference
50.48	59.49	65.78	15.20

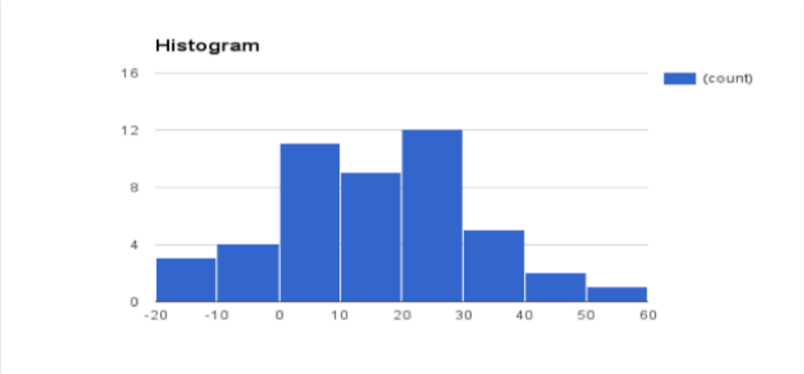

Figure 2.1. Histogram illustrating the normal distribution of student's comprehension achievement scores.

Factor	*df1, df2*	*F*	*Sig.*
Full ANOVA Model	2, 92	23.035*	<.001
Beginning vs. End	1, 92	33.987*	<.001
Middle vs. End	1, 92	11.528**	.001
End vs. Beginning	1, 92	46.245*	<.001

Note. *p < .05. **p < .01. ***p < .001.

Table 2.4:

The percentage of students taking the CARS test at different grade levels on the CARS test

Grade level on CARS	8 grades lower	7 grades lower	6 grades lower	5 grades lower	4 grades lower	3 grades lower	2 grades lower	1 grade lower	At grade level
Percentage of students	42%	4.17%	4.17%	16.67%	8.33%	25%	20.83%	12.5%	4.17%

Diversity among student learners

The standard deviation for each of the items on the Learning Profile Questionnaire for the sample of 20 students is presented in Table 2.5. The standard deviation indicated which questions showed the most variability and thus the most diversity of student learning. The items on the questionnaire corresponding to the highest six values include "Sometimes I get frustrated with my work and do not finish it", "I like to work by myself", "I like to work in

pairs or in groups", "I like to have an unlimited amount of time to work on an assignment", and "I like to learn by moving and doing", and "I like to discuss things with others right away" The high standard deviation on these items reveal that the students demonstrate significant variability in the learning profiles, indicative of prevailing diversity within the context of the study.

Table 2.5:

SD for the Learning Profile Questionnaire

Item Number	SD
I like to work in pairs or in groups.	2.22
I like to have an unlimited amount of time to work on an assignment.	2.21
Sometimes I get frustrated with my work and do not finish it.	1.96
I like to work by myself.	1.96
I like to learn by moving and doing.	1.93
I like to discuss things with others right away.	1.93
When my teacher gives an assignment, I like to create my own steps on how to complete it.	1.88
I study best when it is quiet.	1.80
I like to learn while sitting at my desk.	1.79
I like to read for myself.	1.79
I am able to ignore the noise of other people talking while I am working.	1.76
I like to have a set amount of time to work on an assignment.	1.76
I work hard for my parents or teacher.	1.70
I work hard for myself.	1.67
I will work on an assignment until it is completed no matter what.	1.66
I like to listen to others read to me.	1.65
I like to think things out.	1.65
I like to work on the floor.	1.43
I like to work at a table or desk.	1.37
When my teacher gives an assignment, I like to have exact steps on how to complete it.	1.19

The relationship between teacher pedagogy and English comprehension achievement for students with diverse learning needs. The average scores of teachers on the different indicators of Danielson's Framework of Teaching and the average percentage increase of students' comprehension scores are presented in Table 2.6. Each teacher's average score for each indicator (Unsatisfactory, Basic, Proficient, Distinguished) across the 16 components on the framework was measured. These scores were compared to the students'

average percentage increase between pre and posttest scores on the CARS test to describe if there exists a relation between teacher pedagogy and increases in student achievement. The highest average score for Teacher 1 on the framework was 0.5 on the indicator Distinguished and the corresponding students' average percentage increase in comprehension scores was 20. For Teacher 2, the highest average score was 0.5 on the Unsatisfactory indicator and the corresponding students' average percentage increase in comprehension scores was -0.023. The highest average score for Teacher 3 was 0.63 on Proficient and the corresponding students' average percentage increase in comprehension scores was 28.47. Lastly, Teacher 4 had a high average score of 0.56 on the indicator Distinguished and the corresponding students' average percentage increase in comprehension scores was 29. This data reveals a positive relational trend between teacher's average scores' on the indicators (Proficient and Distinguished) and their corresponding students' average percentage increase in comprehension scores (20%, 28.47%, 29%).

A further analysis of all the teachers reveals additional trends between teacher pedagogy and student achievement (Table 2.7). On the components related to knowledge of students, setting instructional outcomes, demonstrating knowledge of resources, and designing coherent instruction, 50% of the teachers were rated as 'Distinguished'. Also 75% of the teachers were 'Proficient' with respect to creating an environment of respect and rapport and establishing a culture for learning; and 50% were 'Proficient' in managing classroom procedures, and engaging students in learning. On the other hand, 75% of the teachers were rated 'Basic' on communicating with students, and 50% were 'Basic' in demonstrating flexibility and responsiveness.

Table 2.6:

The average scores for each teacher on the Danielson's Framework and the average percentage increase in student's comprehension scores.

Teacher	Unsatisfactory	Basic	Proficient	Distinguished	Average % increase of

					students
Teacher 1	0	0.25	0.25	0.5	20
Teacher 2	0.5	0.38	0.13	0	-0.023
Teacher 3	0.06	0.25	0.63	0.06	28.47
Teacher 4	0	0.06	0.38	0.56	29

Table 2.7:

The percentage of old teachers' ratings on different components of the Danielson Framework

Component	Unsat*	Basic	Prof**	Dist***
Demonstrating knowledge of students	25%	--	25%	50%
Setting instructional outcomes	25%	--	25%	50%
Demonstrating knowledge of resources	--	25%	25%	50%
Designing coherent instruction	--	25%	25%	50%
Creating an environment of respect & rapport	--	--	75%	25%
Establishing a culture for learning	--	--	75%	25%
Managing classroom procedures	25%	--	50%	25%
Communicating with students	--	75%	--	25%
Engaging students in learning	25%	--	50%	25%
Demonstrating flexibility & responsiveness	25%	50%	25%	--

Note. *Unsat – Unsatisfactory **Prof – Proficient ***Dist – Distinguished

An examination of five additional teachers revealed the average scores of teachers on the different indicators of the Danielson's Framework of Teaching are indicated in Table 2.8. The high average score for Teacher 5 was 0.56 on 'Unsatisfactory', for teacher six was 0.63 on ''Unsatisfactory', for teacher seven was 0.56 on 'Basic', for teacher eight was 0.69 on 'Basic', and teacher nine was 0.69 on 'Unsatisfactory'. Thus, it can be seen that the teachers' high average scores on the Danielson's Framework of Teaching were either 'Unsatisfactory' or 'Basic'.

The patterns for Teachers 5 through 9 (Table 2.9) revealed that 80% received 'Unsatisfactory' for designing student assessments, and 60% received 'Unsatisfactory' rating for demonstrating knowledge of content and pedagogy, knowledge of students, using questioning techniques, and using assessment in instruction. Further, 80% of the teachers

were evaluated as 'Basic with regard to setting instructional outcomes, establishing a culture for learning, and managing student behaviors. While 60% were considered 'Basic' for the knowledge of resources, designing coherent instruction, managing classroom procedures, and engaging students in learning.

Table 2.8:

The average scores for each new teacher on the Danielson's Framework

Teacher	Unsatisfactory	Basic	Proficient	Distinguished
Teacher 5	0.56	0.44	0	0
Teacher 6	0.63	0.38	0	0
Teacher 7	0.13	0.56	0.31	0
Teacher 8	0.06	0.69	0.31	0
Teacher 9	0.69	0.31	0	0

Table 2.9:

The percentage of new teachers' ratings on different components of the Danielson Framework

Component	Unsat*	Basic	Proficient	Dist**
Demonstrating knowledge of content	60%	40%	--	--
Demonstrating knowledge of students	60%	20%	20%	--
Setting instructional outcomes	20%	80%	--	--
Demonstrating knowledge of resources	40%	60%	--	--
Designing coherent instruction	40%	60%	--	--
Designing student assessments	80%	20%	--	--
Establishing a culture for learning	--	80%	20%	--
Managing classroom procedures	40%	60%	--	--
Managing student behaviour	20%	80%	--	--
Using questioning & discussion	60%	40%	--	--
Engaging students in learning	40%	60%	--	--
Using assessment in instruction	60%	40%	--	--

Note. *Unsat – Unsatisfactory **Dist – Distinguished

The role of teacher's beliefs and education on pedagogy

In order to understand the influence of teachers' beliefs (qualities of effective teachers, role of collaboration, and knowledge of child's socio-cultural factors), and education (preservice and inservice) on teacher pedagogy, codes were derived from the interview data.

Differentiation. One code that emerged from the data was "differentiation". Differentiated instruction is defined by Tomlinson, Brighton, & Hertberg (2003) as the way

in which a teacher anticipates and responds to a variety of students' needs in the classroom. To meet students' needs, teachers differentiate by modifying the content (what is being taught), the process (how it is taught) and the product (how students demonstrate their learning). Even though two of the teachers deemed differentiation within the classroom an essential component of effective teaching, all four teachers regarded it as a challenge in their current context. For example, when asked about the crucial teacher skills for being an effective teacher, one teacher stated, “being able to differentiate in the class, to adapt to the content to suit my student's needs is the most important” (E.Shah, personal communication, June 23, 2016). Further, she stated “learning to differentiate effectively in the classroom is the biggest challenge, as one model does not work for all”.

Additional interviews with five teachers added to the needs assessment also revealed a similar code, “differentiation”. The teachers regarded differentiation as essential for effective teaching, as highlighted by comments like “knowing your child and hence differentiating is important” (S. Nataraj, personal communication, September 7, 2016), and “Differentiation is crucial, and it is possible only when the teacher has sufficient information about the child” (R. Walia, personal communication, September 7, 2016). Yet, on the other hand, some teachers deemed differentiation as their biggest challenge. One teacher stated, “differentiating for the child is very tedious” (R. Walia, personal communication, September 7, 2016). Whereas, others indicated, “being able to alter the content to the needs of the children and hence differentiating is a huge challenge” (J. Reddy, personal communication, September 7, 2016), and “each child is very different. One is too fast, and another is too slow. I have tried buddies and assigning different roles to each, but differentiating continues to be a challenge” (M. Rehman, personal communication, September 7, 2016).

Educational degree, theory & knowledge. Similarly, teachers regarded an educational degree, theory, knowledge about the brain, and teacher pedagogy to be

fundamental for teaching, as revealed by one teacher's response "I think teachers need to know theory, curriculum content. They need to know knowledge of child development and along with that psychology helps – knowing the psychology of the brain, the psychology of learning. It is important to know how the brain works" (I. Chugh, personal communication, June 23, 2016). However, teachers deemed the influence of the education received on their current planning, classroom instruction and management to be negligent or minimal as demonstrated through the response, "Frankly speaking, not at all. Not really. Very little. I was somewhat aware of different disabilities by the end, but had no idea about instruction, brain functioning, or theory at all" (A.Kazi, personal communication, June 23, 2016).

Conversely, all of them appreciated the strong influence of the in-service training, specifically on classroom instruction as displayed in their responses "Yes definitely. The professional development in the school has helped me immensely I would draw connects from the information offered during professional development with my own classroom and further discuss it with the coordinator" (A.Kazi, personal communication, June 23, 2016), and "Yes of course. That is where I derive all my knowledge for planning. This has been the most influential aspect in training me as a teacher" (M.Eshraghi, personal communication, June 23, 2016). Most of them also considered a growth mindset and adopting the role of a lifelong learner to be crucial attitudes of effective teachers, as verified by their responses "You have to be a lifelong learner, be joyful, and have a positive attitude" (I. Chugh, personal communication, June 23, 2016) and "having a growth mindset in the key to effectiveness" (M.Eshraghi, personal communication, June 23, 2016).

Additional interviews with five new teachers added to the needs assessment also revealed similar codes. Teacher remarks like "a degree is important of course and that must be coupled with experience" (M. Rehman, personal communication, September 7, 2016), and "a degree is important to a large extent" (R. Walia, personal communication, September 7,

2016), displays the new teachers' regard for a degree for teaching. Comparably, they too did not consider their education as influential in their classroom planning and instructional strategies as most of them said "Not really" (S. Nataraj, personal communication, September 7, 2016), "Not at all" (J. Reddy, personal communication, September 7, 2016), "None" (R. Walia, personal communication, September 7, 2016), or "Not much" (T. Jha, personal communication, September 7, 2016). However, all teachers appreciated the positive role of professional development in supporting their plans and instructions. Teachers' statements included "I have understood the significance of knowing the child" (S. Nataraj, personal communication, September 7, 2016), "Yes for sure" (M. Rehman, personal communication, September 7, 2016), and "The professional development has been very influential in helping me plan for classes. It helped me to task analyze" (J. Reddy, personal communication, September 7, 2016).

Socio-cultural factors. The teachers also thought that knowledge of the child's socio-cultural factors would serve to better understand the child, provide consistency and impact their planning as reflected in their responses, "Yes it is. Because where the kids come from influences how they learn, specifically the language they are exposed to. Their values, attitudes, social organizations, families are all essential because that's what makes the child a learner. It influences how the child learns" (I. Chugh, personal communication, June 23, 2016), and "Yes of course. It is very important, especially because while choosing the learning goals, I can incorporate their background knowledge during instructions" (M.Eshraghi, personal communication, June 23, 2016).

Additionally, the five teachers later added to the needs assessment also held that knowledge about the child's sociocultural background was beneficial in their teaching roles. These aspects were divulged in teachers' responses, like, "information about the child's sociocultural background impacts the child's likes, dislikes, and communication" (T. Jha,

personal communication, September 7, 2016), and "sociocultural background knowledge helps me know about the parental involvement and also sync better to the child" (J. Reddy, personal communication, September 7, 2016).

Collaboration. Furthermore, collaboration between teachers was deemed to lead to a richer teaching experience by all teachers as seen through their responses "Absolutely! Unless teachers collaborate, teaching is not effective" (I. Chugh, personal communication, June 23, 2016), "Yes! While collaborating with another, we better understand how the student is in different settings" (M.Eshraghi, personal communication, June 23, 2016), "It is very important. If I am doing something in one way, I can figure different perspectives" (A.Kazi, personal communication, June 23, 2016) and "Yes. If I collaborate, I get more feedback, more ideas, specifically with regard to little things with a child - his specific needs" (E.Shah, personal communication, June 23, 2016). Thus they thought of collaboration as leading to better understanding through exposure to different perspectives, providing a variety of ideas and resources, and a tool to bridge interdisciplinary goals effectively.

The five teachers included in the needs assessment later also believed that collaboration was an effective tool, as seen through their responses, "my planning is enhanced significantly due to collaboration with teachers" (T. Jha, personal communication, September 7, 2016), "collaboration provides me with a range of strategies, resources, and materials" (T. Jha, personal communication, September 7, 2016), and "collaboration helps me use others' successes in my own teaching" (S. Nataraj, personal communication, September 7, 2016).

Lifelong learner. All the five new teachers added to the needs assessment believed that being a lifelong learner was an essential characteristic of an effective teacher. Several statements revealed the same, such as, "learning from the kids and colleagues is important" (M. Rehman, personal communication, September 7, 2016), and "I realize I am learning so

much more as a teacher than I did as a student" (J. Reddy, personal communication, September 7, 2016).

Influence of teachers' beliefs about teaching and their self-efficacy on students' English comprehension achievement

The average scores of teachers for Traditional and Constructivist Teaching Items on the Teacher Belief Survey (TBS) instrument and the difference in the scores are presented in Table 2.10. This data reveals that three of the four female teachers used in this study had a more constructivist rather than a traditional approach. Also, the average scores of teachers from the additional needs assessment for Traditional and Constructivist Teaching Items on the Teacher Belief Survey (TBS) instrument, the difference in the scores, and the resulting approach are presented in Table 2.11. It can be seen that all five teachers had traditional teaching approaches.

The difference in average traditional and constructivist teaching scores, the resulting approach, and the average percentage increase of their students' comprehension scores on the CARS test is shown in Table 2.12. Here, three of the teachers who adopted a constructivist teaching approach show a corresponding average percentage increase of 20, 28.47, and 29 on their students' comprehension scores on the CARS test. A comparison of the teacher beliefs scores to their corresponding student comprehension scores confirmed that teachers who were more constructivists in their approach tended to have higher average percentage increases in their student's comprehension score. On the other hand, the students of the teacher who held traditional teaching approach failed to demonstrate a percentage increase of their scores on the CARS test.

Teacher's total efficacy scores on the Teacher Sense of Self-Efficacy instrument along with the average percentage increase of their students' comprehension scores on the CARS test are shown in Table 2.13. The findings did not show a relational trend between

teacher's self-efficacy scores and student's comprehension scores. For instance, one teacher has a low self-efficacy (M = 6.3) and a corresponding high percentage increases in her students' comprehension scores (M = 28.47).

Based on the above findings, it can be concluded that a positive relational trend exists between teacher's constructivist beliefs and student's comprehension scores. Students with teachers who held constructivist beliefs had higher comprehension scores, but those with a teacher who had a traditional belief had lower comprehension scores. Also, there seems to be a lack of a relational trend between teacher's self-efficacy and student's comprehension scores. Teacher's self-efficacy score seemed to be unrelated to students' increase or decrease in comprehension scores. Based on these conclusions from the sample of the four old teachers, it can be inferred that students with the new five teachers who held traditional beliefs would have lower English achievement scores.

Table 2.10:

Average scores of old teachers for Traditional and Constructivist Teaching Items and Difference in Scores on the Teacher Belief Survey (TBS)

	Teacher 1	Teacher 2	Teacher 3	Teacher 4
Average Traditional Teaching (TT) Score	3.45	3.18	4	3.45
Average Constructivist Teaching (CT) Score	5	2	4.2	4
Difference in average scores (CT – TT)	1.55	-1.18	0.2	0.55

Table 2.11:

Average scores of teachers for Traditional and Constructivist Teaching Items, Difference in Scores on the Teacher Belief Survey (TBS), and the resulting approach.

	Teacher 5	Teacher 6	Teacher 7	Teacher 8	Teacher 9
Average Traditional Teaching (TT) Score	4.64	3.91	4.27	3.45	5.36
Average Constructivist Teaching (CT) Score	3	2.2	2.8	2.7	2
Difference in average scores (CT – TT)	-1.64	-1.71	-1.47	-0.75	-3.36
Approach	TT	TT	TT	TT	TT

Table 2.12:

The difference in average traditional and constructivist teaching scores, the resulting approach, and the average percentage increase of their students' comprehension scores on the CARS test.

Teacher	Difference in average scores (CT – TT)	Approach	Average % increase of their students' comprehension scores on CARS Test
Teacher 1	1.55	CT*	20
Teacher 2	-1.18	TT**	-0.023
Teacher 3	0.2	CT	28.47
Teacher 4	0.55	CT	29

Note. *CT – Constructivist Teaching **TT – Traditional Teaching

Table 2.13:

Teachers' total average efficacy scores and the average percentage increase of their students' comprehension scores on the CARS test.

Teacher	Teachers' total average efficacy score	Average % increase of their students' comprehension scores on CARS Test
Teacher 1	8.8	20
Teacher 2	6.5	-0.023
Teacher 3	6.3	28.47
Teacher 4	7.8	29

Relational trend between teacher's beliefs, efficacy, and pedagogy

Table 2.14 represents the teachers' belief, average efficacy score, and average scores on the different indicators on Danielson's Framework. It can be seen that teachers with the higher average scores on the indicators 'Proficient' and 'Distinguished' on the Danielson's Framework were also the teachers who held more constructivist beliefs. However, there appears to be lack of a relational trend between the teachers' average efficacy scores and their average scores on the different indicators of the framework.

Furthermore, the five new teachers' belief, and average scores on the different indicators on Danielson's Framework are illustrated in Table 2.15. It is observed that teachers with the higher average scores on the indicators 'Unsatisfactory' and 'Basic' on the Danielson's Framework were also the teachers who held more traditional beliefs.

Table 2.14:

Old teachers' approach, average efficacy score, and average scores on the different indicators on Danielson's Framework.

Teacher	Approach	Average Efficacy Score	Unsat.	Basic	Proficient	Dist.
Teacher 1	C	8.8	0	0.25	0.25	0.5
Teacher 2	T	6.5	0.5	0.38	0.13	0
Teacher 3	C	6.3	0.06	0.25	0.63	0.06
Teacher 4	C	7.8	0	0.06	0.38	0.56

Table 2.15:

New teachers' approach, and average scores on the different indicators on Danielson's Framework.

Teacher	Approach	Unsat.	Basic	Proficient	Dist.
Teacher 5	T	0.56	0.44	0.00	0.00
Teacher 6	T	0.63	0.38	0.00	0.00
Teacher 7	T	0.13	0.56	0.31	0.00
Teacher 8	T	0.06	0.69	0.31	0.00
Teacher 9	T	0.69	0.31	0.00	0.00

Relationship between students' home literacy environment and English comprehension achievement

The sample size, mean, skewness, and kurtosis values for students' home literacy environment (HLE) scores and comprehension scores on the CARS test are represented in Table 2.16. The sample size was N = 24. The mean for CARS was M = 14.92 and for the home literacy environment (HLE) was M = 2.79. Further, the standard deviation for CARS was SD =18.00, and for HLE was SD = .86. The skewness and kurtosis statistic for CARS were both normally distributed as suggested by the scores *sk* = -1.18 and *k* = -.641 respectively. On the other hand, the kurtosis statistic for HLE, though slightly peaked, was *k* = .807. Even though the skewness statistic for HLE was slightly outside the normal range s*k* = 1.003, it is only minimally outside the normal threshold and overall approximates a normal distribution.

Table 2.17 shows the Pearson's correlation coefficient between students' home literacy environment (HLE) scores and comprehension scores on the CARS test. The Pearson correlation coefficient value *(r*) between CARS and HLE was $r = .154$, $p = .471$. This relationship was not statistically significant.

The Spearman's correlation coefficient was used to examine the relationship between the HLE scores and the CARS CATEGORY (improvement and no improvement). The findings are displayed in Table 2.18. The relationship was not statistically significant, $r = 0.53$, $p = .806$. In sum, the analysis of the data illustrates no relationship between a student's home literacy environment and their comprehension scores on the CARS test.

Table 2.16:

The N statistic, mean statistic, skewness, and kurtosis for students' home literacy environment (HLE) scores and comprehension scores on the CARS test.

	N	Minimum	Maximum	Mean	Std.Dev.	Skewness		Kurtosis	
	*Stat	*Stat	*Stat	*Stat	*Stat	*Stat	Std. Error	*Stat	Std. Error
CARS	24	-18.33	50.00	14.9204	18.0044	-1.18	.472	-.641	.918
HLE	24	1.58	4.91	2.7913	.8579	1.003	.472	.807	.918
Valid N	24								

Note. *Stat – Statistic

Table 2.17:

The Pearson's correlation between students' home literacy environment (HLE) scores and comprehension scores on the CARS test.

		CARS	HLE
CARS	Pearson Correlation	1	.154
	Sig. (2-tailed)		.471
	N	24	24
HLE	Pearson Correlation	.154	1
	Sig. (2-tailed)	.471	
	N	24	24

Table 2.18:

Spearman's correlation between students' home literacy environment (HLE) scores and the category (improvement or no improvement) of students' comprehension scores on the CARS test.

	HLE	CARS CAT.

Spearman's rho	HLE	Correlation Coefficient	1.000	0.53
		Sig. (2-tailed)	.	.806
		N	24	24
	CARS CAT.	Correlation Coefficient	0.53	1.000
		Sig. (2-tailed)	.806	.
		N	24	24

Limitations

The literature review covers a range of factors related to the teacher, school, and family as impacting diverse students' comprehension in special education urban schools. However, comprehension is a complex construct (Rupp, Ferne, & Choi, 2006), requiring a range of sub-skills, including accessing content. Since English Language Learners (ELL) have difficulties in using the content, and may not have existing language to make sense of new text, their comprehension scores may be further impacted. Hence, in addition to considering the factors in the review as related to children with learning difficulties, it would also be important to include English Language Learners (ELL) in the review.

The study used the CARS test, formatted in a multiple-choice format, as a measure of comprehension. However, research demonstrates that even though multiple-choice tests are widely used as measures of comprehension, they are better regarded as a problem solving rather than a comprehension measure (Rupp et al., 2006). Further, comprehension in non-testing situations rarely entails problem solving abilities, and is rather driven by purpose where the reader uses his or prior knowledge to organize the new information in a coherent manner (Rupp et al., 2006). Since prior knowledge is considered crucial in comprehension, it follows that individuals with differing levels of prior knowledge will display different levels of comprehension (Johnston, 1984). In this study, as the participants have varied cultural, linguistic, and family backgrounds, it is likely that their levels of background knowledge differ considerably, thus impacting their overall comprehension scores. Additionally, some researchers consider the multiple-choice format in the CARS test as an insufficient measure of reading comprehension (Fiene & McMahon, 2007). Theorists consider the process used to

answer multiple-choice questions differs significantly from those considered in models of reading comprehension (Rupp et al., 2006). Furthermore, researchers have disregarded standardized tests of reading comprehension as conclusive measures of student's reading comprehension, and consider alternative methods such as, classroom-based processes (Fiene & McMahon, 2007), and response process models, and questionnaires for particular test items (Rupp et al., 2006) as better-suited indicators of reading comprehension. As a result, using the CARS test as a single measure of comprehension can be considered a limitation of the study.

Discussion

The findings reveal that teacher pedagogy is an important consideration with regard to students' English comprehension achievement. A positive relationship was demonstrated between teacher pedagogical practices in the classroom as indicated by teacher's average scores' on the higher indicators ('Proficient' and 'Distinguished') of the Danielson framework (1996; 2013) and their students' average percentage increase in comprehension scores on the CARS test (20%, 28.47%, 29%). Further data analysis revealed that teachers were rated 'Distinguished' in demonstrating knowledge of students and for designing effective instructional outcomes, whereas they were rated as 'Proficient' in creating an environment of respect and rapport and establishing a culture for learning. These findings are consistent with earlier research that found effective teacher practices to include developing positive relationships with students (Crawford, 2011; Stronge et al., 2011), providing instructions in an engaging manner (MacSuga-Gage et al., 2012), and being aware of students' needs (Lyon & Weiser, 2009). Additionally, Flynn (2007) who used similar data collection techniques like observations and interviews also found that teachers' instructional practices impacted student achievement directly. Moreover, the qualitative data from interviews provided evidence that teacher pedagogy was significantly impacted by teacher's beliefs and

in-service teacher education. This finding is in agreement with previous research suggesting that teachers' classroom practices are impacted by teachers' beliefs about learning and teaching (Applefield, Huber, & Moallem, 2001; Kukari, 2004; Koutselini & Persianis, 2000; Moore, 2008; Yilmaz & Sahin, 2011) and in-service teacher education (Dharan, 2015; McCutchen et al., 2002; McKenzie, Sharp, Paxton, & Murray, 2002; Singer, Lotter, Feller, & Gates, 2011).

Further, a comparison of the teacher's beliefs scores on the Teacher Beliefs Scale (TBS) by Woolley et al. (2004) to their student's comprehension scores on the CARS test showed three of the teachers who adopted a constructivist teaching approach had a corresponding average percentage increase on their students' comprehension scores on the CARS test. However, contrary to conclusions from published research demonstrating the impact of teacher self-efficacy on student achievement (Chang, 2015; Corkett, Hatt, & Benevides, 2011; Tschannen-Moran & Hoy, 2001), the study failed to demonstrate a relationship between teacher's self-efficacy scores based on a questionnaire and student's comprehension scores on the CARS test. On the basis of these results, and the positive correlation between teacher beliefs, teacher pedagogy, and students' comprehension achievement, it can be concluded that teacher beliefs significantly impact teachers' instructional practices, and hence student outcomes in the classroom. The findings also suggest that students with teachers who held traditional beliefs would have lower English achievement scores on the CARS test. These conclusions can be further supported by the ecological systems theory (Neal & Neal, 2013), which highlights the social interactions between the child and the teacher within the school microsystem as impacting the child.

Lastly, a lack of a relationship was indicated by Pearson's correlation between the students' comprehension scores on the CARS test and the home literacy environment (HLE), between home literacy environment (HLE) and 'improvement' on the CARS comprehension

assessment. Based on this analysis, it can be deduced that the student's comprehension scores on the CARS test was unrelated to the variables in the home environment and more significantly impacted by factors related to the teacher, namely their beliefs. However, this is incongruous to the ecological system theory (Neal & Neal, 2013), which considers the family microsystem (students' home literacy environment), consisting of the daily interactions between the child, the parents, and other family members, as a significant influencing component for the child. As such, the findings from the needs assessment reveal that the primary factors associated with low English comprehension achievement are traditional teacher beliefs and unsatisfactory teacher pedagogical practices. With respect to the former, traditional beliefs related to classroom management, such as maintaining control, setting rules, and providing fixed schedules. In addition, traditional beliefs were associated with classroom teaching practices such as the over reliance on textbooks and guides, limited assessment tools, and procedures, and high teacher control in the classroom. The unsatisfactory teacher pedagogical practices in the classroom were in the domains of knowledge of students, instructional practices, classroom management, student engagement, and adopting responsiveness, and flexibility in instruction.

CHAPTER 3 – INTERVENTION LITERATURE REVIEW

Introduction

The results from the needs assessment revealed a positive relational trend between teacher pedagogical practices and student comprehension scores. Hence, teacher pedagogy is an important consideration with regard to students' English comprehension achievement. Further, the quantified qualitative data (Teddlie & Tashakkori, 2003) from interviews revealed that teacher pedagogy was influenced by teachers' beliefs and in-service teacher education. In particular, teachers with constructivist teaching beliefs had greater increases in their students' comprehension achievement over the course of the academic year than their counterparts with traditional beliefs. Also, teachers rated as proficient and distinguished teachers, as determined by the Charlotte Danielson Framework for Teaching, held more constructivist beliefs, thus indicating a positive relational trend between teacher's pedagogical practices and their beliefs. On the other hand, the needs assessment failed to establish a relationship between teachers' self-efficacy scores and student comprehension. Additionally, there was not a relationship between students' comprehension scores and their home literacy environment.

The findings from the needs assessment of teachers teaching for one or two years provides an understanding that within this context, teachers with constructivist beliefs have better teacher practices in the classroom, and improved student outcomes (Shah, 2016). These findings have implications on novice teachers. A follow-up needs assessment showed that novice teachers, those who have been teaching at the school for a period of two to four months, held traditional beliefs about teaching and learning and their pedagogical practices in the classroom were 'Unsatisfactory' and 'Basic'. Since we know that within this context, teachers with constructivist beliefs who are rated as 'proficient' and 'distinguished' in their pedagogical practices have greater improvement in student outcomes than those with

traditional beliefs and poor teaching practices, it can be inferred that new teachers who hold traditional beliefs, and demonstrate below or average teaching practices, as indicated by ‘unsatisfactory’ or ‘basic’ ratings will have students with lower English achievement scores without an intervention that aims to mitigate these factors.

In sum, the data from the needs assessment suggests that there were two key drivers for poor student reading comprehension outcomes, namely traditional teacher beliefs and unsatisfactory teacher pedagogical practices. With respect to the former, traditional beliefs related to classroom management, such as maintaining control, setting rules, and providing fixed schedules. In addition, traditional beliefs were associated with classroom teaching practices such as the over reliance on textbooks and guides, limited assessment tools, and procedures, and high teacher control in the classroom. The unsatisfactory teacher pedagogical practices in the classroom were in the domains of knowledge of students, instructional practices, classroom management, student engagement, and adopting responsiveness, and flexibility in instruction.

Reform Initiatives

Constructivism is emerging as the more accepted pedagogy across the world leading to substantial changes in teaching beliefs and practices (Capps, Crawford, & Constas, 2012; Prawat, 1992; Vijaya Kumari, 2014). In the United States of America, the "No Child Left Behind" legislation (2001) is an educational reform movement based on a constructivist theory of learning (Aldrich & Thomas, 2005). In addition, the reform movements in primary education curriculum in 2005 and 2006 in Turkey are grounded in constructivist principles (Özar, 2012). Also, constructivism forms the basis of China’s pedagogical reform, an initiative introduced by the Ministry of Education (MOE) in China in 2001 (Tan, 2016).

In India several policies and legislation efforts such as the *Sarva Shiksha Abhiyan* (SSA) [Education for All Movement] programme, the National Curriculum

Framework (NCF) in 2005, and the Right to Education Act (RTE) in 2010 are based on constructivist principles. The constructivist principle holds the child as an active contributor at the center of the educational process. The basis of the constructivist approach delineated in the NCF is an inquiry-based method as teachers facilitate students to construct their own knowledge (National Council for Educational Research and Training, 2005). Besides, the Persons with Disabilities (PWD) Act in 1995, and the Right to Education Act (RTE) in 2010 have compelled the assimilation of students with disabilities into regular schools in India (Indian Ministry of Law and Justice, 2009). Even though the government has been dedicated to improving the prospects for education for children with disabilities and has made efforts towards establishing a constructivist teaching approach, the evidence of such reforms has failed to be displayed in the classroom practices in India (Batra, 2005). Furthermore, SSA's 11th Joint Review Mission proclaimed that the NCF's vision was unrealized in spite of SSA's provision of huge funding towards teacher development provided through teacher training initiatives (Brinkmann, 2015). Brinkmann, (2015) attributed the unrealized effects of reforms to the discrepancy between teacher's beliefs related to learning and teaching and the constructivist principles that form the basis of the policies and programs.

Even though policies around the world are reflecting a more constructivist approach to education, and express great potential in transforming education, literature has demonstrated that such principles are not expressed within classrooms (Batra, 2005, Brinkmann, 2015). A review of 416 classrooms in both public and private schools across India found that teachers used traditional methods of instruction where the role of the teacher was paramount and students were passive participants in the learning process (Singh and Sarkar, 2012). Additionally, Nargund-Joshi et al. (2011) found that teachers' classroom practices did not echo the reform initiatives, and instead teaching practices more strongly reflected cultural aspects embedded into Indian educational institutes, such as providing

students with knowledge, adopting textbooks as transmitters of information, and placing significance on exam performance. Batra (2005) attributes the failure of constructivist inspired policies to be realized in classroom practices to the lack of attention to the teacher. Specifically, Batra (2005) further contends that teachers' own schooling and training experiences in institutions reflecting more traditional notions of education do not allow the teachers to develop critical, independent thinking, or collaborative learning skills. On the other hand, Vijaysimha (2013) highlights that the lack of teacher preparation was prevalent due to the dearth of institutes offering education programmes in India. Further research demonstrates that teachers continue to receive little or no in-service training in the school setting in India (Hodkinson & Devarakonda, 2009). Hence, researchers suggest remodeling the pre and in-service teachers' experiences in a manner that reflects the policies and enable effective transference to classrooms (Batra, 2005; Brinkmann, 2015).

Professional Development Model

Needs Assessment Findings

The needs assessment data revealed that the key drivers for poor student outcomes at the school were traditional teacher beliefs related to classroom management and teaching practices, and below or average teaching practices in the domains of knowledge of students, designing coherent instruction, managing classroom behaviours, student engagement, and adopting responsiveness, and flexibility in instruction. Since teachers in India are entering schools with traditional notions of teaching (Batra, 2005; Singh and Sarkar, 2012), and these traditional notions result in ineffective instructional practices, such as overemphasis on textbooks as transmitters of knowledge, the learners' passive role in education, and placing value on examinations (Batra, 2005; Nargund-Joshi et al., 2011) it follows that teachers will need opportunities to challenge their existing beliefs. Therefore, a dearth of effective pre-service teacher education in India results in teachers coming into schools feeling unprepared

for teaching in diverse classrooms (Vijaysimha, 2013). In-service learning opportunities may be an appropriate tool to equip them with the knowledge and skills required for diverse classrooms and other components related to teaching (Deng & Harris, 2008; Lawrence, Mongillo, & Hong, 2013).

Defining Professional Development

Professional development is described as "a complex process, which requires cognitive and emotional involvement of teachers individually and collectively, the capacity and willingness to examine where each one stands in terms of convictions and beliefs and the perusal and enactment of appropriate alternatives for improvement or change" (Avalos, 2011). Guskey (2002) has referred to professional development, regardless of their design, delivery methods, and matter covered, as organized and structured undertakings with the aim of modifying the teachers' classroom practices and beliefs, and the eventual goal to alter students' learning outcomes. Hence, professional development is conceived of as the set of knowledge- and skill-building activities that raise the capacity of teachers to respond to external demands and to engage in the improvement of practice and performance (Elmore, 2002).

Impact of Professional Development

Yet, research has also repeatedly demonstrated the weak impact of such programs. Guskey (2002) states, "reviews of professional development research consistently point out the ineffectiveness of most programs" (pp. 381–382). The ineffectiveness of professional development programs is attributed to several factors, including lack of teacher motivation about participation, and teachers' poor understanding regarding teacher change (Guskey, 2002), insufficient teachers' active participation (Batra, 2005; Hill, 2009; Murphy et al., 2004), and the isolated nature of program delivery in professional development (Darling-Hammond & Richardson, 2009; Desimone, Porter, Garet, Yoon, & Birman, 2002; Jeanpierre,

Oberhauser, & Freeman, 2005; Penuel, Fishman, Yamaguchi, & Gallagher 2007). Other research has also stressed the ineffectiveness of traditional, workshop oriented professional development rooted in assumptions about teacher deficiencies, that provide teachers opportunities within a fixed schedule, usually not embedded into the teacher's classrooms, and lack of follow-up support structures (Clarke & Hollingsworth, 2002; Garet, Porter, Desimone, Birman, & Yoon, 2001; Ng & Tan, 2009; Spilkova, 2001; Svendsen, 2016). The unsatisfactory impact of professional development programs can also be attributed to Immunities to Change, which are the "the underlying barriers that prevent an individual from making progress toward a desired professional goal" (Helsing, Howell, Kegan, & Lahey, 2008, p. 441).

Professional Development in India

Research situated in the Indian context, attributes the ineffectiveness of professional development programs to several factors, including the quality of the professional development training, the inconsistency between the desired approach and training methods, and other barriers within the classroom, like structures, and resource availability (Brinkmann, 2015). Moreover, even though the cultural influence on teacher pedagogy is considered significant in India (Clarke, 2003), India has adopted a centralized policy-making practice that allows the teacher training curriculum to be developed by individuals removed from specific contexts of teaching, resulting in lack of consideration of contextual influences (Dyer et al., 2004). Additionally, Raths (2001) has ascribed the inadequate impact of professional development to the premise that these programs are based on. Specifically, the training programs fail to reach the expected outcome as they regard the teachers as passive recipients who will adopt the existing framework, rather than create their own understanding within their contexts based on merging the new information with preconceived notions (Batra, 2005; Raths, 2001).

Further, Applefield et al. (2001) have implied that a directive instructive learning approach adopted during pre-service teaching is more likely to lead to teachers' traditional beliefs about learning and teaching, which will be further evidenced in their classroom teaching practices. These traditional notions of learning where any learner is viewed as a passive recipient of knowledge are established within cultural factors related to gender, caste, hierarchy, and knowledge transmission in India (Brinkmann, 2015).

Effective Professional Development

Researchers also consistently highlight the importance of professional development targeting transformative beliefs and practices, rather than assuming that the desired changes in teacher methodologies would result from exposure to a variety of forms of professional development (Kose & Lim, 2011). So, effective professional development models ensure that teacher learning is congruent with teachers' beliefs and knowledge (Desimone, 2009).

Professional development programs rooted in constructivist principles are demonstrated as effective in impacting teachers' beliefs and practices (Arce et al., 2014). For instance, Arce et al. (2014) found that teachers exposed to professional development rooted in an inquiry-focused, constructivist approach, led teachers to adopt more learner-centered beliefs about teaching, such as attributing significance to students' context, and viewing students as active participants who construct their own knowledge, as disclosed through teacher interviews, and teachers' descriptions of their classroom practices. The positive influence of teacher training embedded in constructivist principles was demonstrated in another longitudinal study (Desimone et al., 2002) spanning over three years, with 207 teachers in 30 schools, in 10 districts. The researchers (Desimone et al., 2002) found that professional development, representing an active learning model, and targeting specific teaching practices was effective in realizing its impact in teachers' classroom practices. Additionally, Penuel et al. (2015) have reported the positive influence of professional

development grounded in reform-oriented activities, like teacher study groups, collaborative teacher sharing, and inquiry-led learning experiences, on the effective implementation of a specific curriculum program. Overall, a host of studies have verified the impact of in-service training provided to teachers on their resulting teaching practices (Dharan, 2015; McCutchen et al., 2002; McKenzie et al., 2002; Singer et al., 2011), specifically with regard to literacy instruction (Carreker, Joshi, & Boulware-Gooden, 2010; McCutchen et al., 2002). In addition, such in-service teacher training has been shown to lead to improved student learning (Kantavong & Sivabaedya, 2010; McCutchen et al., 2002).

As a result, it would follow that it is essential to capture the teachers' existing beliefs as well as their congruence to the teachers' instructional practices during the training period in order to ensure the success of professional development (Arce et al., 2014; Beck et al., 2000; Nicolaidis & Mattheoudakis, 2008; Theriot & Tice, 2009). Teacher beliefs addressed and refined through teacher reflection (Pajares, 1992; Richardson, 2003; Woolfolk-Hoy et al., 2006) has been accepted in literature as an essential component of professional development (Ng & Tan, 2009; Shabeeb & Akkary, 2014). Specifically, the reflective process developed by Schön (1983) has been increasingly applied within professional development models, as it allowed teachers to move away from their earlier established conceptions of teaching and learning and examine the impact of new beliefs, theories, and assumptions (Shabeeb & Akkary, 2014). Research has also demonstrated the positive impact of modeling exercises, guided practice opportunities, and teachers' experiences with favorable outcomes during professional development in modifying their beliefs about learning and teaching (Fives & Buehl, 2008). During the professional development, the opportunities provided to participants to identify, change, test, and convert their beliefs into practices more effectively (Nargund-Joshi et al., 2011), has been reflected in different methods of instructions and routines in the classroom (Donaghue, 2003; Golafshani, 2013). Hence, the alignment between teachers'

beliefs about learning and teaching and classroom practices is demonstrated to result in enhanced student learning outcomes (Kleickmann, Tröbst, Jonen, Vehmeyer, & Möller, 2016).

Theoretical Framework

A social constructivist perspective regards learning as a process of knowledge construction, rather than knowledge transmission, and it involves action, as the learner creates new meaning and understanding based on his or her interactions with the environment through a reflective process (Aldrich & Thomas, 2005; Applefield et al., 2000; Dagar & Yadav, 2016). Here, knowledge construction is viewed as the result of the interaction between the individual learner and his or her environment, where the role of the learner is considered paramount. In addition to placing the learner at the center of the process, collaboration among learners is emphasized in this framework (Tam, 2000; Vijaya Kumari, 2014). So, learners share their individual conceived frameworks with peers during the learning process, resulting in knowledge being continuously refined. In essence, constructivism conceives of learning as an active, learner focused, collaborative process that results from the complex interaction between the learner's prior knowledge, the learning context, and the content at hand (Dagar & Yadav, 2016; Tam, 2000; Vijaya Kumari, 2014). As beliefs are unique and personal to each person (Pajares, 1992), and is created based on the individual's experiences, the constructivist perspective would be a suitable framework.

Accordingly, it follows that in order to promote learning, it is necessary to create appropriate and relevant learning environments where the learner is provided with opportunities to construct his or her knowledge as an active participant, as he or she guides the learning process (Tam, 2000). Furthermore, constructivist learning environments can be conceived as providing learners with authentic problems and embedding learning in real contexts, situating learning within a collaborative model, providing learners with various

modes of representation, modeling, coaching, and promoting reflective opportunities to allow learners to be aware of the knowledge creation process (Vijaya Kumari, 2014). The teacher training program based on constructivist beliefs about learning result in teachers employing different methods of instructions, such as introducing relevant tools to support student learning, connecting learning to real-life situations, and providing access to knowledge in a variety of ways, and student engagement in the classroom (Golafshani, 2013), utilizing student-centered learning approaches (Peabody, 2011), using evidence-based behaviour management practices (Blotnicky-Gallant et al., 2015), and flexible grouping practice in the classroom (Lee et al., 2013). Additionally, applying constructivist principles in teacher training is found to affect their beliefs about content learning and teaching (Beck, Czerniak, & Lumpe, 2000), and as a result is assumed to influence their practices with their students (Marra, 2005).

Synthesis of Professional development Literature

Contributing factors

Teacher Beliefs. Fives & Buehl (2008) refer to teacher beliefs as beliefs "preservice and practicing teachers have about topics and / or constructs related to teaching, learning, and education" (p.135). According to Borg (2011) beliefs are "propositions individuals consider to be true and which are often tacit, have a strong evaluative and affective component, provide a basis for action, and are resistant to change" (p. 370). Thus, teachers' beliefs include the notions about learning and teaching that they embrace as the truth. Further, teachers' beliefs include aspects related to learners, teachers, knowledge, pedagogy, instructional related components, students, including students' ability to learn, developmental processes, parents, culture, language, socioeconomic status and other areas of the organization (Fives & Buehl, 2008; Tondeur et al., 2009).

Researchers have outlined three sources of teacher beliefs, including personal life

experiences, experiences as a student, and experiences with formal knowledge (Enderle et al., 2014; Richardson,1996; Riojas-Cortez et al., 2013; Tillema, 2000) and hence the teachers' beliefs are well constructed before they enter training programs (Murphy et al., 2004). In addition to teachers' experiences, researchers have emphasized the role of media, and the impact of socialization, in influencing teachers' development of beliefs about learning and teaching (Aldrich & Thomas, 2005). Research has also demonstrated the strong impact of school culture, including administrative and organizational structures, on teacher beliefs, learning, and teaching (Avalos, 2011; Darling-Hammond & McLaughlin, 1999; Desimone, 2009; Kraft & Papay, 2014; So & Watkins, 2005). Scholars have found that the earlier a belief is formed, the more difficult it is to change (Pajares, 1992).

There is a tremendous amount of research that shows how teachers' beliefs influence their teaching practices (Chan et al., 2007; Doruk, 2014; Fajet et al., 2005; Kukari, 2004; Leavy et al., 2007; Moore, 2008; Sang et al., 2012; Stuart & Thrulow, 2000; Taskin-Can, 2011; Yilmaz & Sahin, 2011) and play a significant role in teacher decision making (Stuart & Thurlow, 2000; Tillema, 2000), and teachers' understanding and ability to engage in effective interactions with students (Hamre et al., 2012). Teachers' beliefs have also been found to greatly impact teachers' conceptions about their students' learning (Murphy, et al., 2004). In sum, teachers' beliefs function as filters, affecting the teachers' interpretation of events; as frames in explaining the problems at hand; or as guides, in impacting teachers' actions (Fives & Buehl, 2008).

In addition, teacher's beliefs about teaching students with special needs are also found to influence the teacher's pedagogical practices in the classroom. Researchers have discussed the significance of teacher's attitudes towards students with special needs as affecting their pedagogical practices and the quality and amount of engagement with the students in the class (Berry, 2010; Odongo, & Davidson, 2016). Also, Khan, Hashmi, & Khanum (2017)

found that teacher's beliefs and attitudes towards students with differing needs influenced the teacher's acceptance of such students in their classrooms and their implementation methods. Overall, literature finds evidence for teacher beliefs regarding students with difficulties as influencing their pedagogical approach in the class, their relationship with the students and parents, their attempts at collaboration and their effectiveness with instructional practices (Ben-Yehuda, Leyser, & Last, 2010).

However, literature has confirmed that the teacher's beliefs and their resulting practices such as altering classroom practices and providing appropriate instructional materials and tools to meet the needs of students with learning difficulties was largely dependent on the teacher's previous experience, training and education with regard to special needs (Avramidis, Bayliss, & Burden, 2000; Khan et al., 2017). Teachers who had prior experience with students with disabilities were positive in their classroom instructional approaches as they created opportunities for student's active participation and interaction with their peers (Leatherman & Niemeyer, 2005). Further research has also shown that teacher's training with disabilities significantly alters their beliefs towards teaching students with learning difficulties. More specifically, when teachers are provided with the appropriate training, they are more confident regarding their practices and were better able to attend to each individual student's needs rather than difficulties (Carroll, Forlin, & Jobling, 2003).

Research has demonstrated that people tend to hold on to their existing beliefs even when presented with conflicting evidence (Pajares, 1992). Studies have also revealed that teachers exposed to traditional teaching practices during their own schooling years, do not easily align their personal beliefs about pedagogy with those highlighted in reform policies within their contexts (Doruk, 2014; Leavy et al., 2007; Taskin-Can, 2011). Since teachers in India are more likely subjected to traditional approaches to learning and teaching (Batra, 2005), they are more likely to be resistant to changes in beliefs. If teachers' beliefs are

unchallenged, the teachers tend to immaturely merge the recently acquired ideas into their pre-existing beliefs and continue to operate from their earlier well-established belief structures (Richardson, 1996). Additionally, researchers have consistently emphasized how beliefs are difficult or resistant to change, especially when they are formed earlier, and established over a longer duration (Fives & Buehl, 2008; Murphy et al., 2004; Pajares, 1992). Moreover, literature also highlights the continued prevalence of teachers' beliefs in the presence of conflicting proof (Murphy et al., 2004).

However, teachers are likely to modify their beliefs only when they are confronted and find their existing beliefs to be inappropriate (Pajares, 1992; Theriot & Tice, 2009). Woolfolk-Hoy et al. (2006) highlight that "teachers change their beliefs as they are made explicit, as they begin to doubt these beliefs, and as they are exposed to powerful alternative conceptions" (p.728).

In a case-study approach study with six middle-school teachers (Theriot & Tice, 2009), the researchers used interviews, classroom observations, and participants' responses on an instrument to determine teachers' beliefs about literacy. The professional development, focused on teaching literacy practices, incorporated isolated workshop delivery. The study results found that even though the professional development was successful in enabling the teacher to adopt new notions about instruction, it failed to allow implementation aligned to these new notions to be realized in the classrooms. The workshop model of professional development did not take into consideration the nuances and complications encountered in the classrooms, such as students' personal likes and dislikes, student resistance to certain activities, time and situational constraints, and content-specific instructions.

The study (Theriot & Tice, 2009), hence, highlights that teachers' articulating and espousing certain beliefs about teaching through professional development does not warranty the transference of these beliefs into instructional practices, due to the teachers' lack of

knowledge in dealing with unanticipated hindrances and barriers. As a result, other research has also emphasized that one standard to be considered for teacher education programs must be beliefs (Raths, 2001).

Additional research by Arce, et al., (2014) found that teachers' beliefs about teaching and learning, and instructional practices were modified depending on the specific experiences included within professional development. The study employed two groups of teachers with similar backgrounds, ethnicity, academic preparation, and years of teaching experience. The professional development program employed to both groups of teachers was identical in terms of quantity provided, but differed in the type of training used. Specifically, the reform-movement professional development rooted in an inquiry-focused, constructivist approach, provided teachers with ongoing, in-depth training through summer and monthly workshops on instructional strategies through the year, classroom observations, modeling of classroom practices, and structures for collaboration. On the other hand, teachers in the traditional group also received an intensive model of professional development, but it was primarily focused on content knowledge transmission. The teachers' beliefs revealed through interviews, and teachers' descriptions of their classroom practices, differed based on the training group they belonged to. The teachers exposed to reform-movement professional development were found to adopt more learner-centered beliefs about teaching, such as attributing significance to students' context, and viewing students as active participants who construct their own knowledge, whereas teachers from the traditional group of professional development reported learning to be an outcome of superior explanations that was reflected in learners' recall ability.

Researchers have also found that the process of reflection encouraged teachers to unravel their own beliefs (Carrington et al., 2010; Díaz Larenas et al., 2013; Farrell & Ives, 2015; Larrivee, 2000). For example, Carrington et al. (2010) in their study, found that pre and

in-service teachers using reflection logs, and engaging in collaborative discussion forums with structured protocols, were able to access, contemplate, analyze, and modify their beliefs within their specific contexts. The study highlights how structured discussions along with self-reflective practices allow teachers to gain greater insight into and change their beliefs about learning and teaching (Carrington et al., 2010). The researchers further found that the teachers' greater awareness of beliefs led them to formulate notions about classroom instructional practices that would reflect their articulated beliefs. Díaz Larenas et al. (2013), in their research with 30 English university teachers, also concluded that teachers' beliefs could be better accessed through teacher interviews, autobiographical dairies, and teacher sharing, that allowed teachers to self-reflect on their previously held conceptions of teaching, and compare those with other teachers' ideas. However, literature studies suggest that teachers require the opportunities to reflect to be provided on an ongoing, long-term basis, as teachers need time to develop the confidence and cooperative skills needed for effective reflection (Carrington et al., 2010; Caudle & Moran, 2012).

Teachers' Efficacy. Self-efficacy is an individual's belief in his or her capability "to organize and execute the course of action required to manage prospective situations" (Bandura, 1977, p.2). An individual's efficacy beliefs are developed through mastery experiences, vicarious experiences, social persuasion, and affective or physiological states (Bandura, 1977). Bandura (1977) further broke down self-efficacy into personal self-efficacy, that is the individual's belief that he or she is competent in performing a task, and outcome expectancy, which is the individual's belief that the purposiveness and performance of a task will lead to favorable outcomes. Teacher self-efficacy is significant, as literature demonstrates its pervasive impact on the teacher's diligence, commitment, and classroom teaching approaches (Goddard & Goddard, 2001; Tschannen-Moran & Hoy, 2001), as well as resulting students' outcomes (Swackhamer, et al., 2009). Furthermore, Bandura (1977)

highlights how teacher efficacy influences behaviour change as a result of the cognitive, motivational, and affective shifts. In sum, studies in the field demonstrate that teacher's high efficacy lead teachers to feel skillful and proficient, set high standards for their students, and approach student learning with a greater sense of confidence and enthusiasm. Further, teachers with increased self-efficacy also design practices, tools, and methods to ensure student success (Bandura, 1993; Pearson & Tan, 2015).

In addition, Bray-Clark & Bates (2003) discuss the positive relationship between favorable self-efficacy beliefs and teachers' willingness to employ the knowledge and skills received from professional development trainings to their classroom. In one study that assessed the impact of a professional development course on teacher's efficacy, the researcher aligned the teacher training program to the four sources of efficacy, namely, mastery experiences, vicarious experiences, social persuasion, and physiological and affective states, as highlighted by Bandura (1997) (Yoo, 2016). In order to provide for mastery experiences, participants were shown effective classroom practices, read relevant journals and books, and engaged in peer discussions. Also, participants observed their peers and teachers' classroom practices so as to obtain vicarious experiences. To offer social persuasion opportunities, the participants received feedback during the training period. Lastly, for physiological states, the participants were guided to create more scaffold instructions from big ideas to avoid negative stressful emotions from seeping in. The study results showed that teachers' efficacy was positively impacted by the professional development (Yoo, 2016).

Another study assessed the impact of a professional development model incorporating DuFour's (2004) theory of effective professional development, Desimone et al.'s (2002) framework of characteristics of effective professional development, and Bandura's (1977) self-efficacy theory. This study found professional development to positively impact the teachers' efficacy. The essential features incorporated into the professional development

included the features like content focus, active learning, coherence, prolonged duration, collective participation, and clear goals. It was found that the professional development positively modified the teachers' self-efficacy.

In addition, other studies highlighting different elements of the professional development model have all shown to positively influence teachers' efficacy. For instance, professional development programs that include collaborative teaching and reflective opportunities serve to increase teachers' efficacy (Lotter, Thompson, Dickenson, Smiley, Blue, & Rea, 2018). Likewise, a teacher research enterprise in a school district in southwest United States using quantitative and qualitative tools, found that a goal-directed, collaborative model of professional development had a positive impact on teachers' personal and general teaching efficacy (Henson, 2001). However, the study also concluded that the impact on teachers' efficacy beliefs was only possible when the professional development was provided on a long-term basis as it allowed teachers the opportunity to think critically and actively remodel their instructional practices. Findings from other studies in Turkey have also verified the positive influence of a professional development program that included mentoring opportunities on teachers' self-efficacy (Ortaçtepe & Akyel, 2015).

Other research studies related to trainings targeted for students with special needs found similar results. Researchers found teacher training that addressed the basic characteristics about students with disabilities, tools for differentiation, and other classroom instructional practices impacted teacher efficacy and skills (Allday, Neilsen-Gatti, & Hudson, 2013; Shani & Hebel 2016). In addition, teacher's experience with students with disabilities during the training period was found to significantly influence teacher's confidence and efficacy for teaching students with special needs (Shani & Hebel, 2016). Furthermore, one study analyzed special education teacher's notions about professional development as influencing their efficacy. Specifically, teachers believed that training opportunities that were

delivered by experts in the field of special education, allowed for teacher's active participation and collaboration, and that exposed teachers to relevant theory and practice were beneficial in affecting their efficacy (Ozcan & Uzunboylu, 2017).

Teachers' practices. One of the most widely cited factors in research as impacting student achievement is the teachers' instructional or teaching practice in the classroom (Batra, 2005; Desimone, 2009; Neuman & Cunningham, 2009). Since teachers are responsible for student learning (Harbour et al., 2015), they employ a range of instructional delivery methods, and tools that help connect the curriculum to the student (Stronge et al., 2011). In terms of literacy, it was found that effective teachers integrated their knowledge of the different components of reading appropriately in their classroom instructions (Flynn, 2007; Lyon & Weiser, 2009), modified their instructional approaches based on individual student needs (Al-Hilawani & Others, 1995; Flynn, 2007; Lyon & Weiser, 2009), supported student learning through modeling and questioning techniques (Taylor et al., 2003), and engaged students in the classroom activities appropriately (Lyon & Weiser, 2009; (Taylor et al., 2003). It is thus evident that teachers' instructional practices impact student achievement directly. As a result, it follows that improving student outcomes in schools is closely linked to modifying teachers' classroom practices (Batra, 2005; Desimone, 2009; Neuman & Cunningham, 2009).

Research demonstrates that teaching practices can be developed and enhanced through teacher professional development programs (Borko 2004; Richardson and Placier 2001; Yoon et al. 2007). Yet, the ineffectiveness of stand-alone, isolated workshop models of professional development, with lack of follow-up support structures in influencing teachers' instructional practices in classrooms is well established in literature (Clarke & Hollingsworth, 2002; Darling-Hammond & Richardson, 2009; Desimone et al., 2002; Penuel et al., 2007; Svendsen, 2016). In providing for additional support, Parkinson et al., (2015), in their study with seventy-eight schools across four school districts, found that a coaching and professional

development program, including seminars, coaching facilities, and provision of literacy resources provided over three years positively impacted the teacher's literacy instruction, and classroom environment, as measured by the Early Language and Literacy Classroom Observation (ELLCO) Tool. Additional research by Neuman & Cunningham (2009) also revealed the impact of different professional development models, including only seminars, coaching with seminars, and a control group, on teacher literacy practices. Similar to other studies they used the Early Language and Literacy Classroom Observation (ELLCO) Tool (Parkinson et al., 2015), to measure teachers' literacy practices in the classrooms. In addition, they also used another tool, the Child/Home Early Language and Literacy Observation (CHELLO), to evaluate the influence of teacher practices in home-based settings. The researchers (Neuman & Cunningham, 2009) found the coaching with seminar model of professional development to be most effective in impacting practices for teachers in classrooms and child-care providers at home across different educational settings. The specific areas of teaching practices as impacted by the coaching and seminar model of professional development in both the studies (Neuman & Cunningham, 2009; Parkinson et al., 2015) include improvements in book area, writing area, physical environment area, support for learning, and teaching strategies, as revealed by the instruments (ELLCO & CHELLO) used.

Additionally, research has revealed that alterations in teacher practices must be supported by continuous development opportunities where teachers engage in collaborative problem solving practices regarding classroom instructional strategies (Knight, 2002; Leithwood, Harris, & Strauss, 2010). Professional learning commuinities are found to imapct teachers' pedagogical content knowledge (Gersten, Dimino, Jayanthi, Kim, & Santoro, 2010; Pella, 2011), and teachers' beliefs about teaching and learning (Coburn, 2001; Horn, 2005; Pella 2011), and hence effect teachers' classroom practices. A review of a variety of

American and English studies (Vescio, Ross, & Adams, 2008) found that PLCs have a positive effect on teachers' practices, as revealed by teachers' adopting a more learner centered approach in teaching, including diverse tools and strategies, demonstrating greater flexibility in classroom arrangements, and differentiating for student learning. Addiitonally, the researchers also found that the teachers made specific modifications, like including mixed group instruction, specific strategy related instructions, and specific resources (Vescio et al., 2008).

Features of Effective Professional development

Since teacher learning is impacted in a variety of ways, both implicit and explicit, it will be essential to identify the crucial characteristics considered within the purview of professional development. Professional development programs vary widely in relation to the content covered, the expected changes in teacher practices, and impact for student outcomes targeted (Garet et al., 2001). The content covered within professional development programs can range from specific subject related content, to teaching pedagogies, to pedagogical content knowledge. On the other hand, the teaching practices highlighted can cover curriculum materials, strategies, tools, and resources. Lastly, student's conceptual understanding or specific skill acquisition can be the focus of the programs. However, different theorists have highlighted similar core aspects of professional development programs. Research identifies certain characteristics of professional development that are considered critical in impacting teacher practices and eventually influencing student achievement. The identified features of effective professional development are; (a) focused content, (b) participants' active learning, (c) coherent professional development activities, (d) reflective practices, (e) prolonged professional development sessions, (f) collective participation, (g) professional learning communities, (h) coaching facilities, and (i) differentiation (Desimone, 2009; Desimone, et al., 2002; Garet et al., 2001; Hord, 1997;

Jeanpierre et al., 2005; Ng & Tan, 2009; Penuel, et al., 2007; Spilkova, 2001; Svendsen, 2016; Vijaya Kumari, 2014).

Content Focus. Content is a broad term referring to specific subject related matter, the specific methods and strategies required for teaching, knowledge about the learner, the learning process, and pedagogical content knowledge (Jeanpierre et al., 2005). Shulman (1987) explained that the knowledge base required for teaching could be considered in seven categories, including knowledge of general pedagogy, knowledge of the student and their learner profiles, knowledge of the educational context, and knowledge of educational purposes, (Shulman, 1987). The remaining three are content related aspects and include knowledge of the content being taught, knowledge of curriculum, and PCK itself (Shulman, 1987). Within any discipline, it is seen that both disciplinary knowledge and pedagogical knowledge are interrelated (Bransford, Brown, & Cockings, 2000). This structure stands in sharp opposition to earlier established notions that effective teaching comprises of a set of teaching tools that can be applied across settings (Bransford et al., 2000). Shulman (1986) defined PCK as that "which goes beyond knowledge of subject matter per se to the dimension of subject matter knowledge for teaching" (p. 9). Shulman identified PCK as a separate sub-category of knowledge, as "a distinctive body of knowledge for teaching" (Shulman, 1987, p. 8). He explained that PCK "represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted, to diverse interests and abilities of learners, and presented for instruction" (Shulman, 1987, p. 8).

Literature studies have established that the content of professional development programs is a vital component in determining the implementation of transformative teaching practices in the classroom (Desimone, 2009; Garet et al., 2001; Kose & Lim, 2011). Additionally, research has demonstrated that teachers' exposure to content knowledge results

in learners' increased knowledge and skill (Jeanpierre et al., 2005; Penuel et al., 2007). Researchers have also explained the significance of embedding specific content knowledge along with strategies within professional development as it equips teachers to develop fluency and ease with the subject matter (Desimone, 2009; Penuel et al., 2007), and targets specific modifications desired in classroom practices (Garet et al., 2001). For instance, the emphasis in professional development can range from equipping teachers to utilize curriculum materials effectively, such as a Math kit, to employing specific strategies in instructional routines, like a questioning strategy, to providing teachers with broad, general teaching propositions. Moreover, the focus of professional development can be altered based on the student learning targets, such as specific ability areas or broad, theoretical understandings. The themes covered within professional development activities can further vary from those related to how students learn to different teaching approaches (Garet et al., 2001).

Active Learning. Scholarly literature has repeatedly emphasized the importance of the active role of teachers in professional development models by explaining to teachers the reasons for an examination and sharing of their beliefs during professional development programs, specifically the correlation between beliefs and practices (Borg, 2011; Caudle & Moran, 2012). As a result, teachers' engagement in professional development as active in discussions, planning, and practice rather than as passive participants is more influential in impacting teacher knowledge, beliefs, and resulting practices (Borko, 2004; Desimone et al., 2002; Garet et al., 2001; Penuel et al., 2007). Also, active participation allows teachers to take greater responsibility of their own learning, and hence seek professional development to meet their specific needs (Diaz-Maggioli, 2004). Active learning can be reflected in various ways, like, observing proficient teachers or being observed, planning the use of new, innovative resources, tools, and strategies in classrooms, analyzing students' work and

leading discussions (Garet et al., 2001). Constructivism, rooted in cognitive psychology, assumes that learners construct their own meaning by linking new information to their existing knowledge, as the teacher facilitates this process by offering the appropriate setting, support, and challenges (Dagar & Yadav, 2016, p. 2). Consequently, the use of constructivist principles in teacher development is also demonstrated as crucial in empowering teachers to adopt constructivist perspectives related to learning and teaching, such as selecting learner centered practices (Aldrich & Thomas, 2005; Arce et al., 2014; Batra, 2005). On the other hand, teachers who are exposed to traditional learning environments are more likely to adopt intermediate beliefs between traditional and constructivist, and prefer to retain the focus on teacher driven procedures (Arce et al., 2014; Demirci, 2015).

A common premise nurtured in Indian society demands children to adhere to norms (Joshi, 2005), whereas curiosity and evaluative tendencies are viewed as characteristics of impolite children (Yunus, 2005). The shared holistic worldview is another cultural paradigm influencing teacher's pedagogical beliefs and practices in India, wherein minimal value is placed on children's conception of their own knowledge, as the expectation is to allow the community to determine decisions related to the student rather than let it be driven by one's own experience (Clarke, 2003). With regard to adult and children communication, children are required to follow adults without questioning (Joshi, 2005), and demonstrate respect towards authority figures (Yunus, 2005). Within the classroom, such authority is indicated by the structural hierarchy of the teacher as authority and qualitative hierarchy as teacher is considered more knowledgeable than the student (Clarke, 2003). Other studies conducted in different states in India; namely, Bihar, Maharashta, and Kerala, have also revealed the student's preference for such hierarchical relationships (Brinkmann, 2015). The children's submissive stance as a result of cultural norms stands in sharp contrast to the expected behaviours underlying the constructivist perspective, which are a hallmark of the several

reform initiatives undertaken in India towards quality education (National Curriculum Framework in 2005), Right to Education Act in 2010). Likewise, the teachers' passive stance in training programs contradicts the constructivist premise that provides the basis of professional development programs.

Coherence. Literature reveals that professional development experiences that are provided as stand alone, disconnected topics, without associations to previous learning are ineffective in meeting its' objectives (Darling-Hammond & McLaughlin, 1999). On the other hand, professional development that is aligned with teacher's objectives, and the prescribed standards and assessments are more likely to impact teacher learning and classroom instructions, such as promoting student inquiry (Desimone et al., 2000; Garet et al., 2001; Jeanpierre et al., 2005; Penuel, et al., 2007).

In addition, the influence of this consistency between professional development and standards is further enhanced when contextual elements and structures are taken into consideration (Penuel, et al., 2007). Research has also emphasized the importance of coherence between teachers' previously acquired knowledge, and new content, and the manner in which the professional development activities provide for communication between teachers with similar objectives (Garet et al., 2001). Further, alignment between professional development sessions and teachers' objectives is considered paramount as it allows teachers to more readily access policy requirements based on their interpretations and personal contexts (Coburn, 2001; Penuel, et al., 2007). As a result, teachers will be more likely to integrate the policy demands with their school's goals, leading to enhanced instruction and innovative practices (Coburn, 2001).

Reflection. Reflection, a process of self-observation and self-evaluation requires the teacher to participate in a systematic, diligent practice of thinking about their practices, and inquire about what else can be done to better their performance as teachers (Larrivee, 2000;

Vijaya Kumari, 2014). It is referred to as the teacher's ability to review their teaching with a critical lens (Svendsen, 2016). However, the intention of analyzing one's practices during reflection moves beyond to determining the underlying ideas and beliefs guiding the practices (Schon, 1983), and provoking formation of new beliefs and accompanying practices (Dewey, 1933), in a constructive and critical manner (Poom-Valickis & Mathews, 2013). Larrivee (2006) states that the effectiveness in managing the classroom, often wrought with surprises, chaos and conflict, cannot be achieved without considerable personal insight, self-awareness and acceptance of responsibility for one's actions (p. 984). Additionally, the process of reflection is especially paramount in teaching and learning since teachers are often faced with novel, unique and challenging situations in their workplace (Ng & Tan, 2009). Engaging in reflection also allows teachers to dismiss the culture of control and instead adopt a culture of inquiry, where problems are viewed as natural events that can be used as opportunities for further improvement (Larrivee, 2006).

Studies have categorized reflection into 2 levels - reflection regarding the specific actions carried out, and reflection on the attitudes, beliefs, and values that underlie the specific actions (Spilkova, 2001). Schon (1983) has referred to the difference as reflection in action that allows for inspecting and thinking about the practices as they are occurring, and reflection on action, which is referred to as thinking back at one's practices, examining, and evaluating it to further understanding. Furthermore, Larrivee (2000) has identified different stages of reflective thinking. In the first stage, teachers attend to the applicability of knowledge to their predefined goals, without any deep assessment regarding its significance or usefulness. The second stage allows teachers to scrutinize, evaluate, clarify, and describe their goals. At the final stage, referred to as critical reflection, the individual moves beyond the current focus of goals to analyze the hidden agendas and assumptions that is their beliefs within a broader context.

The research literature has also demonstrated the potential negative impact of reflective exercises. As engaging in reflection can stimulate undesirable or threatening notions for the individual, it can result in increased anxiety and adverse emotions, causing the individual to retreat from the process (Spilkova, 2001). Researchers have emphasized the significance of a safe and trusted space in order to support teachers to reveal their beliefs (Larrivee, 2000), in addition to providing structures for teachers to engage in reflective practices along with their colleagues in a collaborative format (Borg, 2011), as these aspects mitigate the possible negative influences of reflection. Other research has also supported teachers' authentic reflections by offering teachers a choice with a range of reflective tools, both oral, and written (Caudle & Moran, 2012; Farrell & Ives, 2015; Saban, Kocbeker, Saban, 2007).

There is a wide range of practices to promote reflection among teachers including both oral and written forms, including journals, dairies, free, independent writing, focused writing, community of practice, video recordings, action research, which are considered appropriate and effective depending on teacher preferences, specific contexts, and alignment to other activities (Díaz Larenas et al., 2013; Farrell & Ives, 2015; Ng & Tan, 2009; Spilkova, 2001; Yost, Sentner, & Forlenza-Bailey, 2000). In order to guide the reflective process, some studies have used journals and dairies to allow teachers to reflect on their own practices (Farrell & Ives, 2015), whereas other studies have used others' classroom problems in order to reduce the emotional bias associated with one's own practice (Poom-Valickis & Mathews, 2013). Moreover, some scholars have used professional development programs with structured opportunities for collaboration (Shabeeb & Akkary, 2014), and communities of practice to allow teachers to engage in critical reflective learning (Ng & Tan, 2009), and other researchers have provided teachers with structured opportunities to engage in reflective practices with a coach using questioning, sharing, and discussions so as to permit teachers to

examine their beliefs and practices in a more objective manner while allowing for perspective sharing on practices that are contextual (Harrison, Lawson, & Wortley, 2005; Poom-Valickis & Mathews, 2013). As teachers are provided with opportunities for dialogue and feedback during reflective practices (Darling-Hammond & Richardson, 2009), teachers are prompted to challenge their conclusions, generate new understandings and knowledge, and approach new issues (Ng & Tan, 2009; Shabeeb & Akkary, 2014). Studies have shown that the use of teacher videos as a tool for reflection in professional development is effective as it provides teachers with the opportunity to notice, think about, and reflect on teacher practices in the classroom (Coffey, 2014; Wang & Hartley, 2003). Wang and Hartley (2003) highlight that videos can be used to "observe and reflect carefully on different issues of teaching and learning in action" (p.112). Further, videos are advantageous in that it allows the intricacies and nuances of classroom instruction to be recorded, stored on a long-term basis, permits accessibility in any context, and lends itself to multiple perspective sharing simultaneously (Coffey, 2014; Tochon, 2007; van Es & Sherin, 2010). In teacher education programs, teachers can be provided with cues or questions that support their viewings and observations of different aspects (Coffey, 2014).

Duration. Another crucial characteristic of effective programs is the intensity and increased duration of professional development. Traditional forms of professional development, structured as isolated, fragmented workshops over short training schedules are found to be ineffective in impacting teacher and student learning (Batra, 2005; Darling-Hammond et al., 2009; Desimone et al., 2002; Penuel et al., 2007). Instead effective professional development is best regarded as an ongoing process rather than a one-shot attempt at modification (Guskey, 2002). Since one of the contributing factors shaping teachers' beliefs about teaching and learning are their personal and professional experiences over several years (Riojas-Cortez et al., 2013; Tillema, 2000), professional development

models may result in teachers' resisting changes in beliefs (Stuart & Thurlow, 2000). It follows that effecting changes in beliefs is a long-term process and cannot be achieved within short periods of time (Beck et al., 2000; Caudle & Moran, 2012; Murphy et al., 2004), as teachers need time to first become mindful of their incongruous beliefs and practices and then engage in thoughtful practices (Helsing et al., 2008; Riojas-Cortez et al., 2013; Yilmaz & Sahin, 2011). Hence some models of teacher change take into consideration the increased time and effort by teachers as it is rooted in the awareness that change is challenging and gradual (Guskey, 2002). Other research has extended the reasons for prolonged duration of professional development as providing the necessary space required for intense examination of content, and strategies; and extending opportunities for teachers to experiment with classroom practices and receive assessments (Desimone et al., 2002; Garet et al., 2001; Penuel et al., 2007). In sum, research has consistently supported an ongoing professional development model provided over a long duration, preferably through the entire academic year (Batra, 2005). The prolonged duration of professional development provided teachers with the required time needed to alter their existing beliefs formed through their own schooling and professional experiences over several years. More specifically, teachers required increased time as they first needed to become aware of their implicit beliefs, then felt comfortable and safe to discuss their perspectives and opinions with others, then considered alternative viewpoints, then compared their ideas and concepts of teaching with those of others, questioned and challenged their existing beliefs, tested new beliefs and teaching methods and practices, and finally adopted alternative frameworks (Batra, 2005; Yoon et al., 2007).

Some researchers have also quantified the ideal duration of effective professional development programs. For example, Darling-Hammond et al. (2009) identified programs that span 30-100 hours over a period of six to twelve months resulting in increased student

performance, whereas programs continuing for five to fourteen hours creating no significant impact. Additionally, the results from the analysis by Yoon et al (2007) also substantiated the same duration as the above study (Darling-Hammond et al., 2009). More specifically, it was found that when teachers receive well-designed professional development, an average of 49 hours spread over six to 12 months, they can increase student achievement by as much as 21 percentile points (Yoon et al., 2007). However, even though time is a significant factor, "time alone is not the answer for providing professional development that improve teacher skills and student learning. There must be support for a teacher during the implementation stage that addresses the specific challenges of changing classroom practice (Gulamhussein, 2013, p.15).

Collective Participation. Effective professional development, according to Zepeda, "is collaborative, providing teachers to interact with peers. Teachers benefit from being in collaborative communities in which they conduct research and work together on issues of instruction, and where they can receive mentoring and peer coaching" (Zepeda, 2003, p.34). Since teachers spend a considerable amount of time isolated in classrooms, they do not engage in discussions with their peers. The collaborative communities benefit teachers by presenting teachers with opportunities for questioning, sharing, and discussions with their peers on practices that are contextual (Harrison et al., 2005; Poom-Valickis & Mathews, 2013), and aids in establishing a 'shared professional culture' (Garet et al., 2001, p. 922), leading to shared understandings among teachers. In appreciating the importance of a community of learners, researchers are recognizing how the social process allows for a continuous integration and re-integration of information with prior available frameworks in a manner that enhances sensemaking and learning (Ng & Tan, 2009). Moreover, the shift from individual to collaboration and participation in group learning formats is featured in literature surrounding effective professional development programs (Borko, 2004; Desimone et al.,

2002; Jeanpierre et al., 2005; Ng & Tan, 2009; Penuel et al., 2007; Putnam & Borko, 2000; Svendsen, 2016).

Professional Learning Communities. Professional learning communities refer to groups of teachers and administrators engaged in sharing and generating new ideas through continuous inquiry and improvement for the benefit of students (Hord, 1997). Research demonstrates that participation in professional learning communities are significant as they lead to increased teacher reflection and results in changes in teacher practices and beliefs about teaching and learning (Allen & Penuel, 2015; Chou, 2011; Coburn, 2001; Fives & Buehl, 2008; Pella 2011; Shabeeb & Akkary, 2014). In particular, PLC meetings provide teachers the opportunity to engage in reflective and sensemaking practices about the ideas of teaching introduced through the workshops in professional development (Allen & Penuel, 2015; Chou, 2011; Coburn, 2001; Pella 2011). Additionally, participating in collaborative inquiry and listening to others' success stories in PLC spaces allowed teachers to reflect on their own practices, shift their perspective and adopt new, alternate ideas, strategies, and tools for classroom instruction (Pella, 2011; Schechter, 2010). Further, engagement with others in PLCs allows teachers to access, integrate, evaluate, and integrate their prior knowledge and experiences to arrive at a consensus in beliefs about learning and teaching (Pella 2011; Hord, 1997). In addition, by providing teachers with opportunities to encounter, share, discuss, and reflect on instructional practices, PLCs also serve to increase teachers' content knowledge across disciplines (Coburn, 2001; Pella, 2011; Schechter, 2010). Since teachers cater to diverse students in the same classroom with differing needs, the use of different video examples will provide increased opportunities for discussions among participants (Brock & Carter, 2015). The desirable changes in teachers' practices and beliefs due to teacher collaboration results in "greater consistency in instruction, more willingness to share practices and try new ways of teaching, and more success in solving problems of practice"

(Darling-Hammond et al., 2009, p.44). Hence it is by collaborating with other participants in their professional community, teachers are able to debate on their personal beliefs, create an integrated understanding (Pella, 2011), and align their beliefs about teaching and learning with policies or adopted school reforms (DuFour & Eaker, 2005; Gee, 2008).

Research literature demonstrates that PLCs can be presented in different formats, like, action research groups (Chou, 2011), teacher clubs (Padwad & Dixit, 2008), lesson study groups (Pella, 2011), and book clubs (Grossman, Wineburg, & Woolworth, 2001). Regardless of the structure used, studies have indicated that effective PLCs have a common set of factors, including (1) shared values, culture and vision that allows for authentic collaboration to take place, (2) supportive and distributed leadership so that members can exhibit autonomy in creating their own learning, (3) systematic structured procedures to promote effective interactions, (4) active learning opportunities, and (5) appropriate resources in terms of time, space, and finance (Borko, 2004; DuFour & DuFour, 2013; Graham, 2007; Hord, 1997; 2004; Little et al., 2003; Louis et al., 2010; Woodland & Mazur, 2015). Research has also highlighted that PLCs take considerable time during implementaiton (Borko, 2004).

Coaching. Even though professional development opportunities may increase teachers' knowledge, it does not necessarily lead to changes in classroom methodologies, unless teachers are provided with consistent assistance (Brock & Carter, 2015; Theriot & Tice, 2009). So, maintaining the impact of professional development programs is better realized when they are embedded into the teachers' classrooms through activities like coaching rather than when provided in a disconnected context, like workshops (Garet et al. 2001; Gulamhussein, 2013). Further, since evaluating beliefs and practices may be an unconventional practice for teachers, and different from the traditional methods of training received that includes merely transferring information and sharing knowledge, suitable support structures provided to teachers during the program will aid in acknowledging and

changing beliefs, rather than teachers' withdrawing from the process, and indulging in practices that are not aligned with constructivist beliefs (Borg, 2011; Fives & Buehl, 2008; Larrivee, 2000; Stuart & Thurlow, 2000). Accordingly, providing on-site coaches for teachers to examine, develop, and assimilate new frameworks with their pre-existing conceptions during training (de Vries, van, & Jansen, 2013), and providing teachers with continual feedback during the process of change (Helsing et al., 2008) is found to have a positive influence on the teachers' beliefs, engagement in the training program, and analysis of classroom practices (Stephens et al., 2011; Trivette et al., 2014). Specifically, the coaches execute three main functions; (1) modeling instructions in the teachers' classrooms, (2) promoting study groups, and (3) conducting meetings with teachers (Neuman & Cunningham, 2009). Other researchers have highlighted that effective coaching incorporates three essential components, namely, (1) modeling, that includes demonstrating the implementation of strategies, (2) accountability, to encourage teachers' implementation of strategies in classrooms, and (3) performance feedback, to provide teachers with comments about their classroom instructions (Brock & Carter, 2015). Furthermore, leaders within an organization will need to ensure appropriate pairing so that coaches who are like-minded and share similar beliefs assist the new teachers through the process of knowledge construction and reflection (Fives & Buehl, 2008).

Differentiation. Personalization is an important movement shaping the educational landscape in the 21st century (Marx, 2014). Marx (2014) states, "In a world of diverse talents and aspirations, we will increasingly discover and accept that one size does not fit all. Part of the puzzle will be how to meet the demand for a more customized, tailored approach to teaching and learning". Bransford et al. (2000) highlight the importance of personalized learning opportunities as they emphasize, "one of the most important tenets of professional learning is that professional development models are learner centered. Professional

development opportunities are selected or crafted by the learner". Even though traditional professional development models assume the same model for all teachers, differences in teachers' knowledge, skills, and attitudes continue to exist, and hence the need to provide teachers with personal choice in professional development to meet their needs for growth is increasingly recognized (Diaz-Maggioli, 2004). Diaz-Maggioli (2004) has provided an organizational framework, called the Teacher's Choice Framework that allows professional development activities to align to teachers' needs and levels of awareness. Professional development can target four different types of teachers' awareness needs, including, technical awareness (classroom procedures, and teaching methods), personal awareness (classroom activities as aligned to real-life tasks), problematic awareness (problems in teaching), and critical awareness (preconceived thoughts, feelings, or actions). In addition, teachers are categorized depending on different awareness-level categories, such as, (1) updated with knowledge and implementation procedures, (2) updated knowledge but lack implementation methods, (3) awareness of development needs in specific knowledge areas, and (4) unawareness of knowledge needs. Therefore, the Teacher's Choice Framework can be used to allow teachers at different awareness levels for different types of knowledge (content, pedagogical, and contextual knowledge) to simultaneously play the role of the expert, in supporting their colleagues, while engaging in self-development with other proficient members. This framework also allows the organization to take advantage of their teachers' positive skills and aptitude, while allowing teachers to appreciate the twofold role of learner and teacher.

Contextual factors, structures (time, space, reflective tools, & opportunities), supportive culture, and supportive leadership. In addition to the type of training, and the support structures employed, research has highlighted several other aspects that are considered crucial in professional development. The design of professional development

programs is enhanced when related to contextual factors (Clarke & Hollingsworth, 2000; Putnam & Borko, 2000; Svendsen, 2016), as researchers from different contexts have shown cultural contexts as impacting teachers' beliefs (Clarke, 2003; Dyer et al., 2004; Kukari, 2004; Moore, 2008). Even though teacher's socialization within their particular cultures largely shapes their ideologies, professional development models fail to consider the significance of the impact of the cultural values on teachers' belief systems (Brinkmann, 2015; Clarke, 2003). Also, the resulting influence of culture on teachers' traditional views of learning and teaching have failed to be considered (Clarke, 2003), which adopts lectures as the primary mode of teaching and places great emphasis on rote learning (Dagar & Yadav, 2016). With regard to recognizing the implication of contexts, researchers propose case studies, and videos as part of the professional development program (Putnam & Borko, 2000), using the actual teaching and collaborative spaces, and using teachers' recorded experiences, and student's work as samples within the professional development model (Clarke & Hollingsworth, 2000).

Given the importance of context in effective professional development, scholars have additionally highlighted the importance of creating a safe and trusted space for teachers within the program to honestly share their beliefs and expose themselves (Larrivee, 2000), providing structures for teachers to engage in reflective practices along with their colleagues in a collaborative format (Borg, 2011), building in time for isolated reflection during the program for teachers (Larrivee, 2000), offering teachers with a variety of oral and written tools for reflection to choose from, including classroom observations, journal writing, interviews, dairies, participation in projects, and use of metaphors (Caudle & Moran, 2012; Díaz Larenas et al., 2013; Farrell & Ives, 2015; Saban et al., 2007), and extending opportunities for teachers to employ both reflection-in-action, and reflection-on-action practices (Yang, 2009). Additionally, a supportive culture would ensure teachers engage in

practices to meet policy demands at different levels while simultaneously reflecting their beliefs (Fives & Buehl, 2008). School culture is the "set of norms, values and beliefs, rituals and ceremonies, symbols and stories that make up the persona of the school" (Peterson, 2002). The school culture can enrich or hamper teachers' professional learning, by either emphasizing the learning process among all stakeholders, or failing to establish clear reasons for training (Peterson, 2002).

In the process of teachers identifying and amending their beliefs, leaders will adopt a facilitative role as they support teachers to discern the discrepancy between beliefs and practices and assist them in developing consensus on belief structures that will result in more effective practices in the classroom (Vroom, 2003). As authentic leaders are characterized by self-awareness, transparency, ethics, and balance processing (Tonkins, 2013), teachers will view such leaders as dependable and genuine, and will be more willing to acknowledge and share their beliefs. As engaging teachers in reflective practices during in-service teacher training would require teachers to access their previously held and deep-rooted beliefs, authentic leadership would be ideal in providing the conditions for higher trust, optimism, and positive emotions to be developed among teachers (Avolio et al., 2004; Jensen and Luthans, 2006). Moreover, during this process of self-discovery, heightened awareness, and shared meaning, leaders and teachers will need to collaborate jointly together (Tonkins, 2013), as leaders encourage teachers to readily unveil their propositions about learning and teaching developed over time through their experiences as a student and teacher (de Vries, van, & Jansen, 2013).

Professional development Designs

Research reveals how professional development programs are designed based on the adopted framework or route to teacher change. On the one hand, professional development results in changes in teachers' knowledge and beliefs, then teacher practices, and finally

student outcomes (Arce et al., 2014; Beck et al., 2000; Desimone, 2009; Nicolaidis & Mattheoudakis, 2008; Theriot & Tice, 2009) On the other hand, research studies have also theorized that professional development triggers changes in teacher practices, then student learning outcomes, and finally teachers' beliefs (Guskey, 2002). This perspective acknowledges that teacher change is a continuous process as changes in teachers' beliefs require consistent reflection, and these changes are the consequence of improved student outcomes. In contrast to the sequential models proposed (Desimone, 2009; Guskey, 2002), a non-linear framework, the Interconnected Model offers a different perspective as an effective model of professional development (Clarke & Hollingsworth, 2002). This model highlights the role of reflection and enactment in enlisting changes across teachers' different domains, namely, external, including external source of information or stimulus; personal encompassing teacher knowledge, beliefs and attitudes; professional, related to teacher practice; and consequence that includes the outcomes. Therefore, the specific design of professional development will vary depending on the framework adopted. Apart from using the structure of teacher change to design professional development programs, other scholars have based the design of professional development on the different stages involved during the reflective process, including the examination stage, the stage of struggle, and the reconciliation stage (Larrivee, 2000). In addition, some studies highlight the significance of engaging in reflective practices to access teachers' beliefs prior or during classroom practices (Farrell & Ives, 2015; Riojas-Cortez et al., 2013), whereas others have demonstrated that changes in teacher beliefs are more likely when teachers engage in reflective practices after classroom practice (Tillema, 2000).

Professional Development for Special Education Teachers

The ineffectiveness of stand-alone professional development workshops in preparing both general and special education teachers for delivery of effective classroom instructional

strategies is well recognized in literature (Brock & Carter, 2015; Clarke & Hollingsworth, 2002; Garet et al., 2001). Literature studies demonstrate that teachers' ability to provide effective instructions for children with disabilities is positively impacted by professional development models that include an emphasis on content, active participation by members, modeling strategies, collaborative forums, and follow-up sessions that target reflections and feedback (Brusca-Vega, Alexander, & Kamin, 2014; LeDoux, Graves, & Burt, 2012).

The review of literature identifies one of the drivers leading to the reform initiatives towards a more constructivist teaching approach in India (National Council of Educational Research and Training, 2005) being realized is the consideration of teacher beliefs in in-teacher education programs (Arce, et al., 2014; Stuart & Thurlow, 2000; Tillema, 2000) that are shaped by a host of individual and cultural factors (Brinkmann, 2015; Clarke, 2003; Dyer et al, 2004). The positive impact of professional development programs on general and special needs teacher practices and beliefs regarding teaching and learning are enhanced depending on the extent to which the program incorporates the features recognized in literature; the content covered (Jeanpierre et al., 2005), the role of the participants as active members (Borko, 2004; Desimone et al., 2002), the coherence between professional development and teachers' goals and other standards (Desimone et al., 2000; Garet et al., 2001); the use of reflection (Larrivee, 2000; Vijaya Kumari, 2014), the intensity and duration of professional development (Darling-Hammond et al., 2009), collective participation (Penuel et al., 2007; Putnam & Borko, 2000; Svendsen, 2016), professional learning community spaces (Allen & Penuel, 2015; Chou, 2011; Coburn, 2001; Hord, 1997), coaching and mentoring opportunities (Stuart & Thurlow, 2000; Theriot & Tice, 2009), and provision for differentiation (Bransford et al., 2000).

Additional factors impacting professional development programs are also identified including the consideration of contextual factors on teacher beliefs (Desimone, 2009; Kraft &

Papay, 2014), the spaces and structures provided to engage in reflection and collaboration (Borg, 2011), the reflective tools employed (Farrell & Ives, 2015), and the support from leaders within the context (Tonkins, 2013). Professional development programs are designed depending on the understanding of teacher change (Desimone, 2009; Clarke & Hollingsworth, 2002; Guskey, 2002); and the process of reflection (Clarke & Hollingsworth, 2002).

CHAPTER 4 – INTERVENTION PROCEDURE AND PROGRAM EVALUATION METHODOLOGY

The key drivers found to impact students' limited improvements in English comprehension achievement at the school were traditional teacher beliefs and unsatisfactory teacher pedagogical practices. With respect to the former, traditional beliefs related to classroom management, such as maintaining control, setting rules, and providing fixed schedules. In addition, traditional beliefs were associated with classroom teaching practices such as the over reliance on textbooks and guides, limited assessment tools, and procedures, and high teacher control in the classroom. The unsatisfactory teacher pedagogical practices in the classroom were in the domains of knowledge of students, designing coherent instruction, managing classroom behaviours, student engagement, and adopting responsiveness, and flexibility in instruction (Shah, 2016). The current traditional, workshop-oriented professional development model (with insufficient teachers' active participation, fixed schedules, lack of follow-up support structures and embedding into the teacher's classrooms) was modified and remodeled to include the features of effective teacher training as identified in the literature findings above (Desimone, 2009; Desimone, et al., 2002; Garet et al., 2001; Jeanpierre et al., 2005; Ng & Tan, 2009; Penuel, et al., 2007; Spilkova, 2001; Svendsen, 2016; Vijaya Kumari, 2014) in order to allow teachers to recognize their beliefs about learning and teaching, challenge their beliefs, modify their beliefs and resulting teacher practices (Donaghue, 2003; Golafshani, 2013; Nargund-Joshi, Rogers, & Akerson, 2011), and exert a positive influence on students' learning outcomes by developing greater alignment between teachers' constructivist beliefs and classroom practices (Kleickmann et al., 2016), and increasing teachers' efficacy (Yoo, 2016). Specifically, a professional development program rooted in constructivist principles (Ng & Tan, 2009; Shabeeb & Akkary, 2014; Vijaya Kumari, 2014), and offering reflective opportunities to participants

(Caudle & Moran, 2012; Farrell & Ives, 2015; Schön, 1983; Yang, 2009) through (a) three participant-driven workshops provided on a monthly basis over 3 months, (b) five professional learning community meetings provided on a bi-weekly basis over 3 months, and (c) eleven coaching sessions on a weekly basis over 3 months for English language teachers at the school under study was conducted. The leadership buy-in within the context of this study was high and hence the role of leadership in implementing the professional development model was not explored.

The research questions that guided the evaluation of the intervention include the following,

1. To what extent did the professional development provide members with participant driven workshops, coaching facilities, professional learning community meeting spaces, reflective practices, structures (space and time), and a culture of trust on an ongoing basis for the entire academic year?
    a. To what extent did members participate in professional development sessions, including participant driven workshops, coaching meetings, and professional learning community meetings?
2. How did teachers' exposure to professional development lead teachers to adopt more reflective practices, increase their awareness of beliefs and discrepancies between their beliefs and practices, and increase their perceptions of knowledge and skills in constructivist teaching and learning?
3. How did teachers' exposure to the professional development and the short-term outcomes (i.e. increase in teachers' 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, and 3) perceptions of knowledge and skills in constructivist practices) change their beliefs about teaching, their efficacy,

instructional practices in the classroom, and the alignment between their beliefs and practices?

Research Design

Mixed-methods research is a methodology for conducting research that includes collection and analysis of both quantitative and qualitative data either concurrently by combining them, sequentially by having one build on the other, or embedding one within the other in a single study or in multiple phases of a program study (Creswell & Plano Clark, 2011). This study employed an embedded design for data gathering and data analysis of both quantitative and qualitative data simultaneously within a traditional quantitative research design (Creswell & Plano Clark, 2011). This study specifically examined the proximal outcomes related to improvements in teachers' 1) reflective practices, 2) awareness of beliefs, and discrepancies between beliefs and practices, 3) perceptions of knowledge obtained and skills in constructivist practices, 4) classroom practices, 5) constructivist beliefs, 6) efficacy, and 7) alignment between their beliefs, and practices. Additionally, the embedded aspects of the study examined the processes as related to the implementation of the intervention. Specifically, the researcher examined the extent of implementation and how the implementation resulted in the short and medium outcomes. The relationship between the inputs, activities, and expected outcomes is presented in the logic model (see Figure 4.1).

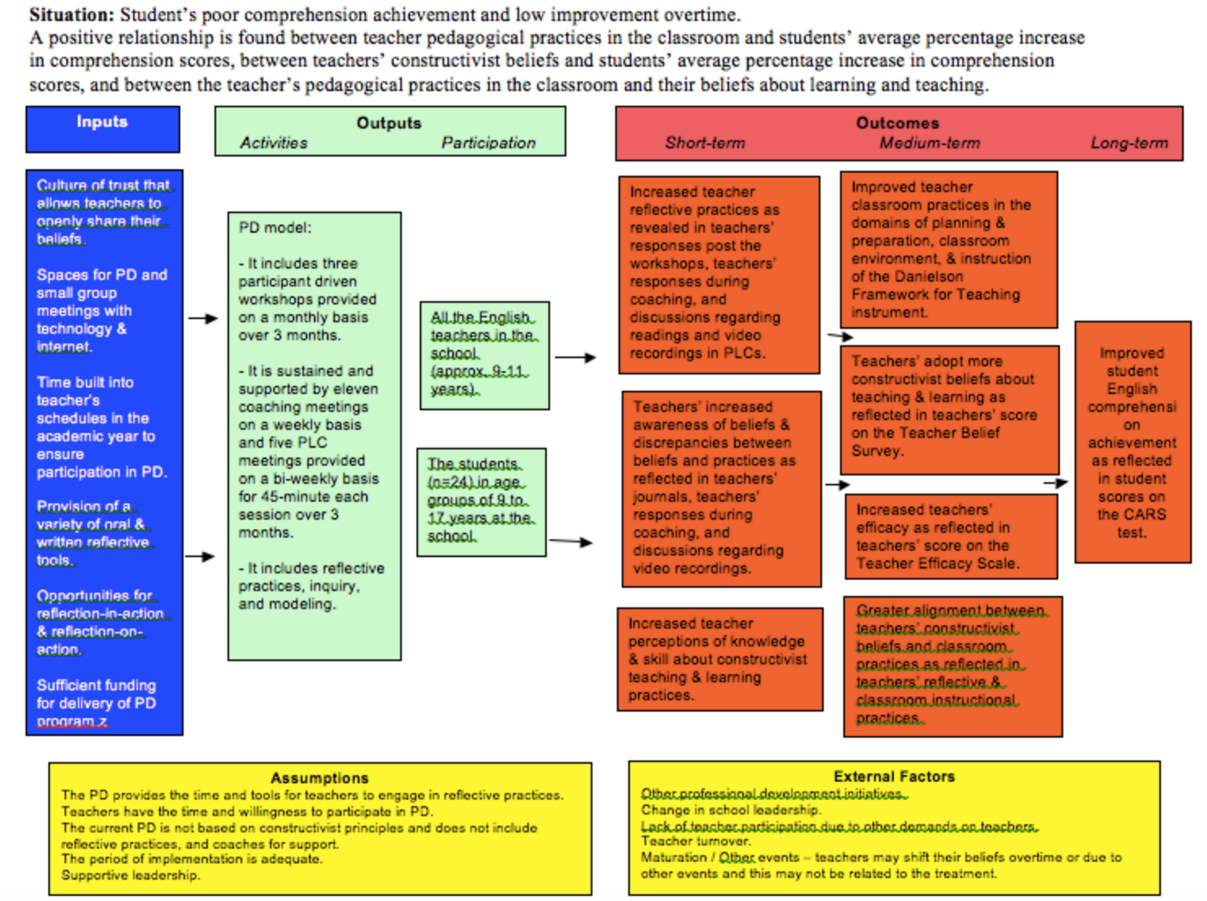

Figure 4.1: Logic Model for Implementation of Professional development

In recognizing the significance of context in effective professional development (Clarke & Hollingsworth, 2000; Putnam & Borko, 2000; Svendsen, 2016), the inputs that facilitated the delivery of the professional development included ensuring that a culture of trust existed so that teachers could safely share their beliefs and about themselves (Larrivee, 2000), providing teachers with spaces and time for collaborative meetings and participation in the professional development program (Borg, 2011; Larrivee, 2000), and offering a range of reflective tools to the teachers to engage in reflection-in-action, and reflection-on-action (Caudle & Moran, 2012; Díaz Larenas et al., 2013; Farrell & Ives, 2015; Saban et al., 2007; Schön, 1983; Yang, 2009). All the language teachers were part of the professional development program that spanned three months to effect change in teachers' beliefs and practices (Caudle & Moran, 2012; Guskey, 2002; Murphy et al., 2004). In acknowledging the failure of traditional, workshop models of professional development in impacting change in

teachers' practices (Darling-Hammond et al., 2009; Desimone et al., 2002; Penuel et al., 2007), the professional development model included three participant driven workshops on a monthly basis, in addition to weekly coaching and bi-weekly professional learning communities (PLC) meetings over three months. Additionally, the professional development activities were rooted in constructivist principles such as the use of authentic problems and embedding learning in real contexts, employing a collaborative model, allowing teachers to engage in different modes of representation and modeling, and including reflective opportunities (Ng & Tan, 2009; Shabeeb & Akkary, 2014; Vijaya Kumari, 2014). The teachers' role during the sessions was active as they indulged in inquiry and reflective activities about specific actions, and their beliefs, and attitudes underlying those actions (Spilkova, 2001), resulting in influencing the teachers' perception of knowledge, beliefs, and resulting practices (Borko, 2004; Desimone et al., 2002; Garet et al., 2001; Penuel et al., 2007; (Shabeeb & Akkary, 2014).

The workshops targeted content related to specific subject related matter (language), the specific methods and strategies required for teaching, knowledge about the learner, the learning process, and pedagogical content knowledge (Jeanpierre et al., 2005), to help increase the teachers' perceptions of knowledge and skill (Jeanpierre et al., 2005; Penuel et al., 2007), while enhancing teachers' use of tools and techniques required for effective delivery (Desimone, 2009; Penuel et al., 2007). On the other hand, the teachers' active engagement in inquiry (Dufour & DuFour, 2013), and the collaborative study of pedagogy in the PLC assisted teachers in collective sensemaking of the content (Gersten et al., 2010; Pella, 2011*)*, and hence were more likely to improve teacher classroom practice. In addition, the teachers' involvement with peers helped to establish a 'shared professional culture' (Garet et al., 2001, p. 922), that allowed teachers to engage in increased reflection and test new beliefs and practices (Shabeeb & Akkary, 2014; Fives & Buehl, 2008). In order to increase

opportunities for teacher reflections, video recordings of multiple models of teaching practices with diverse student populations were shown to teachers via videos in the PLC meeting spaces (Brock & Carter, 2015). In order to ensure that the perceptions of knowledge, skills, and ideas about teaching and learning are transferred to the class (Theriot & Tice, 2009), a coach supported teachers in examining and developing their beliefs, and testing new frameworks about teaching and learning (Borg, 2011; Fives & Buehl, 2008; Larrivee, 2000; Stuart & Thurlow, 2000), by organizing a meeting space (Neuman & Cunningham, 2009). Specifically, the coaches modeled effective instructional strategies, encouraged teachers to implement the strategies in classroom practices and hence built accountability (Brock & Carter, 2015), provided teachers with continual feedback as teachers experimented with new instructional strategies (Helsing et al., 2008), and supported teachers in analyzing their classroom practices (Stephens et al., 2011; Trivette et al., 2014).

The expected short-term outcome included increased teacher reflective practices, and resulting increased teacher awareness regarding their beliefs and the discrepancy between beliefs and practices (Díaz Larenas et al., 2013; Farrell & Ives, 2015; Larrivee, 2000), as reflected in teachers' journals, teachers' responses during coaching, and discussions regarding video recordings. In addition, increased teacher perceptions of knowledge and skill regarding constructivist teaching and learning practices was a short-term outcome. The teachers' adopting more constructivist beliefs about teaching and learning as per teachers' scores on the Teacher Belief Survey, teachers' aligning their beliefs to classroom practices, teachers' increased efficacy as revealed through improved scores on the Teacher Efficacy Scale, and an improvement in teacher practices (Chan et al.; Fajet et al., 2005; Kukari, 2004) in the domains of planning and preparation, classroom environment, and instruction of the Danielson Framework for Teaching instrument encompassed the medium-term outcomes. In the long-term, the expected impact is improved student English comprehension achievement

(Borko, 2004; Clarke & Hollingsworth, 2002; Desimone, 2009; Garet et al.,2001), as demonstrated by students' scores on the CARS test.

However, the model of professional development assumed certain structures and aspects to be in place at the context. One of the assumptions included the expectation that teachers will be provided with the time and tools to engage in reflective practices. There are several conflicting demands that teachers have to grapple with in the course of the day and hence it was imperative for the school leaders to ensure that time for reflection was factored into their schedule and included across professional development sessions over the three month intervention period. Further, in order to enlist teacher motivation and willingness to participate in professional development, it was essential to provide the teachers with the rationale for the inclusion of certain activities and structures in the professional development framework along with research supporting the modified aspects. It was expected that teacher buy-in for professional development would be enhanced when teachers were educated about the data from the needs assessment and literature in the field of professional development. Additionally, it was imperative for the modified professional development system to be implemented over three months in order to obtain valid results about the impact of intervention (Batra, 2005; Guskey, 2002). The different aspects of professional development, including the workshops, coaching, and PLC spaces were not immaturely discarded, and the format of the sessions was followed consistently to the end of the academic year as it was expected to impact student achievement (Desimone et al., 2002). Lastly, supportive leadership ensured that teachers were provided with the required assistance needed during professional development, and the professional development system was consistently adhered to through the three months (Avolio et al., 2004; Jensen and Luthans, 2006; Vroom, 2003).

The proposed impact of the professional development model on student achievement may be hampered by the influence of some external factors, such as lack of teacher

participation due to other conflicting demands on teachers like outreach projects, or substitution for other teachers in the event of illness, marriage, etc. Teacher turnover during the year may also impact the attendance of participants at the workshops, and PLC spaces, hence breaking the established group and discussions in the middle of the year. In addition, other professional development initiatives during the same period may interfere with analyzing the effect of the current professional development system. A change in leadership during the implementation period may result in altered support structures or changes in objectives that will impact the delivery of the professional development model. Finally, the influence of professional development may be confounded if teachers are engaged in reflective activities as a result of initiatives that are not directly affiliated with the proposed intervention.

The logic model is expressed in the theory of treatment (Figure 4.2). The independent variable is the delivery of the modified professional development model designed to increase (pre and post) teachers' constructivist beliefs about teaching and result in improved teacher practices. This was reflected in the improvement of teachers' 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices (Díaz Larenas et al., 2013; Farrell & Ives, 2015; Larrivee, 2000), 3) teachers' perceptions of knowledge of and skills in constructivist practices, 4) classroom practices (Fajet et al., 2005; Kukari, 2004), 5) constructivist beliefs (Nicolaidis & Mattheoudakis, 2008; Theriot & Tice, 2009), 6) efficacy, and 7) alignment between their beliefs, and practices (Arce et al., 2014; Beck et al., 2000), and are included as mediating variables in the theory of treatment. The teachers' constructivist beliefs and improved practices are expected to lead to improved student English comprehension achievement (Borko, 2004; Clarke & Hollingsworth, 2002; Desimone, 2009; Garet et al., 2001), as demonstrated by students' scores on the CARS test. Yet, this was not realized in the study due to the limited duration of the intervention.

Additionally, the moderating variables incorporated the factors that contributed to realizing the proposed impact of the independent variable, namely the implementation of professional development sessions with respect to high and low fidelity.

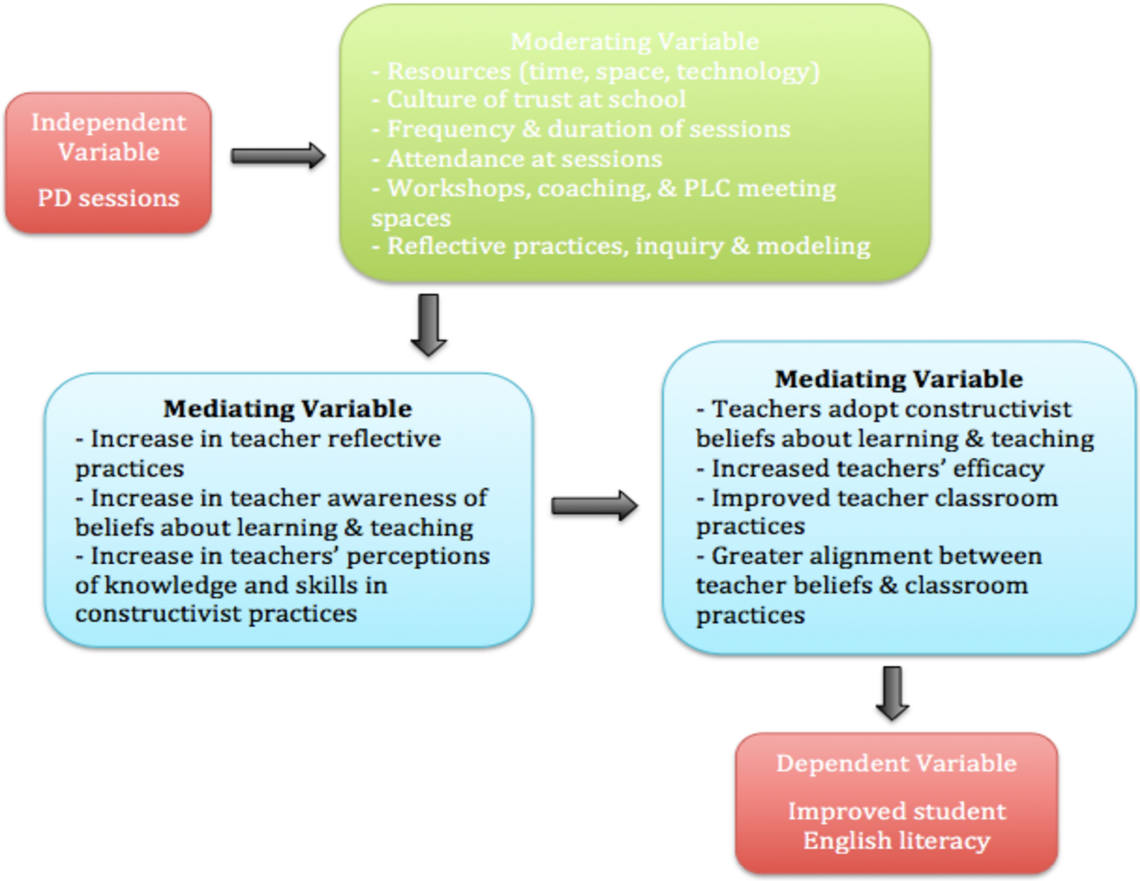

Figure 4.2: Professional Development Theory of Treatment Model

The design for examining the implementation of the intervention, and the proximal outcomes of the intervention, are outlined in the following sections on process, and outcome evaluations respectively.

Process Evaluation

The process evaluation relied on quantitative data to examine the process of implementation. The evaluation of implementation was summative, as the data was analyzed at the end of the intervention.

Fidelity of implementation for this study is defined as the extent to which the professional development program is delivered to the participants as proposed by the investigator, and the extent to which members attended the professional development sessions (Dusenbury, Brannigan, Falco, & Hansen, 2003). The specific components included in the professional development program are supported by research, namely, providing constructivist learning environments (i.e. participant driven workshops including the use of inquiry, authentic problems, modeling, and scaffolding opportunities) (Fives & Buehl, 2008; Marra, 2005), the use of reflective practices (Farrell & Ives, 2015; Saban et al., 2007), the prolonged duration of the model on an ongoing basis (Batra, 2005; Lee, 2005); the provision of coaches (Stuart & Thurlow, 2000), and participation in professional learning communities (Fives & Buehl, 2008). These components are featured in the 'inputs' and 'activities' section of the logic model (Figure 4.1), and as moderating variables in the theory of treatment model (Figure 4.2).

The extent to which the professional development sessions included these inputs and activities determined the adherence of implementation fidelity (Dusenbury et al., 2003; Nelson, Cordray, Hulleman, Darrow, & Sommer, 2012). The attendance at meetings was also considered significant to fidelity of implementation in research, and was hence included as a moderating variable in the theory of treatment (ToT). This correlated with another indicator of implementation fidelity, namely, participant responsiveness (Dusenbury et al., 2003; Nelson et al., 2012). An additional moderating variable incorporated in the theory of treatment (ToT) was exposure or dosage, another dimension of implementation fidelity, referring to the proposed number, length, and frequency of sessions implemented (Dusenbury, 2003; O'Donnell, 2008).

In this study, high fidelity referred to inclusion of reflective practices, inquiry, and modeling into each professional development model session, 95% - 100% participant

attendance at the different professional development sessions, and 95% - 100% delivery of sessions in terms of proposed number, frequency, and duration. Research has consistently supported an ongoing professional development model provided over a long duration (Batra, 2005; Lee, 2005). As a result, the frequency and duration of the different components of the professional development model were also considered as an indicator of fidelity. On the other hand, low fidelity referred to less than 80% professional development sessions including reflective practices, inquiry, and modeling, less that 80% teacher attendance at more than 10% of the professional development sessions, and less than 80% of professional development sessions delivered as proposed.

Outcome Evaluation

This study proposed to investigate how the components included in the professional development model, namely the participant-driven workshops, coaching, and PLC meetings led to increased 1) reflective practices, 2) awareness of beliefs, and discrepancies between beliefs and practices, 3) knowledge and skills in constructivist practices, 4) classroom practices, 5) constructivist beliefs, 6) teacher efficacy, and 7) alignment between teacher's beliefs, and practices. The evaluation relied on quantitative, and qualitative data to examine the proximal outcomes. The evaluation of implementation was summative, as the data was analyzed at the end of the intervention.

In order to examine the probability that the intervention would lead to the expected outcomes, a power analysis was conducted and threats to validity were examined. Previous studies were used to determine an appropriate effect size (Hill, Bloom, Black, & Lipsey, 2008; Lipsey, 1988). Two research studies represent the components of the intervention highlighted in the current proposed model and addressed outcomes that were similar to this study. The research by Dunne, Nave, and Lewis (2000) assessed the impact of teachers' collaboration within a professional learning community (an aspect of the proposed

intervention) on teaching practices, and student learning outcomes. The researchers found an effect size of 0.289. The power analysis using the G Power computer program required that a total sample size of n=75 was needed to examine the same effect for a power = .80 and an alpha level = .05. Another study by Kraft, Blazar, and Hogan (2016) was also examined. This meta-analysis of 37 studies examined the mean effect of coaching (an aspect of the proposed intervention) on teachers' instructional practices and students' academic achievement. They found the effect size of 0.57 for teacher instruction. The power analysis indicated that a total sample size of n=21 is needed. When considering both studies, the sample sizes required for the effect sizes range from n = 21 to 75 participants. This sample size was not possible for the current study. As a result, it was not possible to analyze the data for statistical significance, and hence descriptive analysis was used for the quantitative data analysis.

Due to the limited sample size (n=9) in this study, and lack of a comparison group, a pre-post study design study was used to evaluate the effect of the intervention on the short and medium outcomes. The pre–post design examines the outcomes of the study before and after the intervention. However, the lack of a comparison group as well as the small sample size makes it difficult to ascertain if the difference in scores were due solely to the treatment. Factors such as changes in time, teacher attrition, or instrumentation may have also confounded the findings and minimized the effect of the intervention on the outcomes (Shadish, Cook, and Campbell, 2002).

The paramount threat to the validity of this study was the threat to internal validity. Even though the participants were first exposed to the intervention and then filled the Teacher Belief Survey (TBS), there could have been other events, like exposure to additional professional development, readings, interactions with other professionals, etc. that took place during this time (between the intervention and posttest) that could have led to the change in teacher's beliefs and instructional practices. Also, maturation or the changes that naturally

take place in the adults could also be the cause of the observed changes in the scores rather than the intervention (Shadish et al., 2002), and hence were taken into consideration as well. Furthermore, teacher attrition was a noteworthy threat as the study used a pre and posttest design (Shadish et al., 2002). The same group of teachers was needed to study the impact of the intervention. If teacher attrition were high, then it would not be possible to make an inference as the data needed to determine the change would not be available. The teachers took the belief survey twice, before and after the intervention. The teacher's scores on the survey after the intervention could be impacted by exposure to the survey prior to the intervention and thus, the threat due to testing was also likely to be present (Shadish et al., 2002). Lastly, since the same survey was used during the pre and posttest, the threats operating through instrumentation may be important (Shadish et al., 2002). The belief survey is a self-report instrument revealing the teacher's beliefs. The beliefs stated might reflect what the teacher candidate believes or what the teacher candidate believes the researchers want to hear. Furthermore, while the survey items are focused on beliefs, merely believing in a theory does not ensure that one will implement aspects of that theory into education practice. In sum, it was not possible to estimate causal effects of the intervention without a comparison group (Shadish et al., 2002), and hence the study's design could only demonstrate changes in scores before and after the professional development intervention implementation. Therefore, in addition to quantitative data, qualitative data from teacher interviews were also considered in the study.

In order to mitigate the threats to internal validity (history), it was ensured at the outset that no other professional development opportunities would be provided to these participants. Also, the researcher interviewed the participants after the posttest to determine the teachers' perceptions about the factors leading to the change in beliefs and practices. Since teacher attrition was a significant issue, the researcher chose the participants based on

an interview to determine their future plans regarding their intentions to stay or leave their position at the school. Finally, with regard to the threats due to testing and instrumentation, it was crucial to explain to the participants at the outset how the impact of the study would be dependent on the truthfulness of their responses. Also, rapport building and a safe, trusting environment helped participants to complete the surveys and engage in the focus groups in a more authentic manner.

Methodology

Participants

The sampling approach in this study required the researcher to use the concurrent mixed method sampling approach, as the participants required for quantitative and qualitative data were chosen concurrently, and the same set of teachers were used for both the quantitative and qualitative data collection (Teddlie & Yu, 2007). Purposive sampling (Teddlie & Yu, 2007) was used in this study to determine the outcomes of the intervention. All the English language teachers, and students were purposively selected through the gradual selection principle, which included the sequential selection of units or cases based on their relevance to the research questions, not their representativeness (Teddlie & Yu, 2007). The research questions in this study focused on changes in English teachers' beliefs, efficacy, and behaviors. As such, the English language teachers (n=9) were selected purposively based on their relevance to the research questions.

Teachers. A total of n = 9 teachers participated in the study. Two teachers have no degree in education; one has a bachelor's degree in psychology with a diploma in special education, two have completed their undergraduate degree in special education, two have a postgraduate degree in special education, and one has a postgraduate degree in counseling psychology. Five of these teachers have had no prior teaching experience, three teachers have

two years, and one teacher has thirty years of teaching experience. All nine teachers have worked at the school for six or more months.

Measures

Process evaluation.

Structures (time, technology, spaces for meetings). The teacher's participation in 95 to 100% of the professional development sessions established high fidelity. Additionally, building in time for isolated reflection during the program for teachers (Larrivee, 2000) was crucial. The professional development sessions required technological tools to facilitate the transmission of the session in the most favorable manner. Additionally, literature shows that providing spaces for teachers to engage in reflective practices along with their colleagues in a collaborative format (Borg, 2011) was required for effective professional development models. These variables are stated as moderating variables in the ToT model and as inputs in the LM. Determining the allocation of time, and spaces for the professional development sessions on Google calendar was used to collect data for structures related to time and space. Also, the investigator determined if the required technological resources were available.

Participants' attendance at meetings. The participants' attendance at the professional development sessions was a significant indicator of adherence with respect to fidelity. It is described in the TOT model under the moderating variable section. The attendance of the participants was documented on Google drive in the professional development session logs.

Frequency, and duration of meetings. Research has consistently supported an ongoing professional development model provided over a long duration (Batra, 2005; Darling-Hammond & Richardson, 2009; Lee, 2005). This indicator is presented as a moderating variable in the TOT model. Data was retrieved from the documented session logs on the school's Google drive.

Culture of trust at the school. Scholars have highlighted the importance of creating a safe and trusted space for teachers within the program to honestly share their beliefs and expose themselves (Larrivee, 2000). This aspect correlates with the indicator of participant responsiveness of implementation fidelity (Dusenbury et al., 2003). This indicator is presented in the inputs section of the LM model and as a moderating variable in the TOT model. The data for this factor was obtained from the anonymous teacher survey results conducted by the school every year related to school culture.

Use of inquiry and reflective practices. Researchers have reported the positive influence of participating in collaborative inquiry in professional development, as it allows teachers to engage in reflective practices (Pella, 2011; Penuel et al., 2015; Schechter, 2010). Research has also demonstrated the positive impact of using reflective practices as a tool in helping teachers acknowledge their beliefs about learning and teaching and further align their beliefs to their classroom practices (Carrington et al., 2010; Farrell & Ives, 2015; Tillema, 2000). In order to guide the reflective process, researchers have used journals (Farrell & Ives, 2015), structured PLC spaces (Pella, 2011), or provided for coaching opportunities (Poom-Valickis & Mathews, 2013). The activities in the LM and moderating variables in the TOT model represent these elements. Data for this construct involved determining the number of professional development sessions (workshops, PLC, and coaching) that included reflective questions to examine program adherence.

Participant-driven workshops. Workshops that target content related to specific subject related matter, the specific methods and strategies required for teaching, knowledge about the learner, the learning process, and pedagogical content knowledge (Jeanpierre et al., 2005), is demonstrated in research as increasing the teachers' perceptions of knowledge and skill (Jeanpierre et al., 2005; Penuel et al., 2007), and enhancing teachers' use of tools and techniques required for effective delivery (Desimone, 2009; Penuel et al., 2007). This factor

has been included within activities in the professional development LM and as a moderating variable in the ToT model. This construct was examined as part of the professional development intervention model to understand the extent of its' effect on the short and medium outcomes. Data was retrieved from the documented session logs on the school's Google drive on a monthly basis (see Appendix H). Additional data for this construct was collected during teacher interviews. These questions asked, "How have the workshops' content & format contributed to your 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, 3) knowledge and skill regarding learning & teaching, 4) ideas or beliefs about teaching and learning, 5) current classroom practices, and 6) helped to align your beliefs with your teaching practices"? The interview questions are in Appendix G.

Professional learning community. Literature finds support for the teachers' active engagement in inquiry (Dufour & DuFour, 2013), and the collaborative study of pedagogy in the PLC in assisting teachers in collective sensemaking of the content (Gersten et al., 2010; Pella, 2011*)*, and resulting positive influence in improving teacher classroom practice. In addition, the teachers' involvement with peers is shown to establish a 'shared professional culture' (Garet et al., 2001, p. 922), that allows teachers to engage in increased reflection and test new beliefs and practices (Shabeeb & Akkary, 2014; Fives & Buehl, 2008). In order to increase opportunities for teacher reflections, video recordings of multiple models of teaching practices with diverse student populations was shown to teachers in the PLC meeting spaces (Brock & Carter, 2015). The reflective prompts used with video recordings included, (1) discuss some of the effective instructional practices used by the teacher? (2) What are some of the instructional practices that require improvement? How can they be addressed? (3) Was this activity / routine / structure demonstrated successful? Why or why not? (4) Did the teachers' actions demonstrate the belief that all students are capable of learning? (5) Did the

teachers' instructional practices meet the needs of all students equally and appropriately? (see Appendix I). This is represented in the activity section of the professional development LM and in the moderating variable section of the ToT.

This construct was examined as part of the professional development intervention model to understand the extent of its' effect in increasing teacher reflective practices, increasing teachers' awareness of beliefs, and discrepancy between beliefs, and practices, increasing teachers' perception of knowledge, and skill about constructivist practices, improving teacher classroom practices, increasing teachers' constructivist beliefs, increasing teachers' efficacy, and increasing alignment between teachers' beliefs, and practices. The research used documented session logs on the school's Google drive on a monthly basis, video recordings of the sessions, and data from the teacher interviews to examine the implementation of the professional learning community. Example interview question included, "How has the PLCs' content & format contributed to your 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, 3) knowledge and skill regarding learning & teaching, 4) ideas or beliefs about teaching and learning, 5) current classroom practices, and 6) helped to align your beliefs with your teaching practices"? The interview questions are in Appendix G.

Coaching. The use of coaches is found to increase the likelihood of knowledge, skills, and ideas about teaching and learning being transferred to the class (Theriot & Tice, 2009). Literature reveals the positive influence of a coach or a mentor in supporting teachers' examination and development of their beliefs, and testing new frameworks about teaching and learning (Borg, 2011; Fives & Buehl, 2008; Larrivee, 2000; Stuart & Thurlow, 2000), Hence, coaching has been included as a moderating variable in the professional development ToT, and as an activity in the professional development LM. Specifically, the coaches modeled effective instructional strategies, encouraged teachers to implement the strategies in

classroom practices and hence built accountability (Brock & Carter, 2015), provided teachers with continual feedback as teachers experimented with new instructional strategies (Helsing et al., 2008), and supported teachers in analyzing their classroom practices (Stephens et al., 2011; Trivette et al., 2014) (see Appendix J).

This construct was examined as part of the professional development intervention model to understand the extent of its' effect on the short and medium outcomes. Data for this indicator was accessed from the audio recordings of the sessions, and the documented session logs on the school's Google drive on a monthly basis (see Appendix J). Additionally, data was collected during teachers' interviews. Example interview questions asked "How has the coaching with your language coordinator sessions' contributed to your 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, 3) knowledge and skill regarding learning & teaching, 4) ideas or beliefs about teaching and learning, 5) current classroom practices, and 6) helped to align your beliefs with your teaching practices"? The interview questions are in Appendix G.

Outcome evaluation.

Increased teachers' reflective practices. The provision of structured spaces, and resources (Borg, 2011; Larrivee, 2000), reflective tools (Caudle & Moran, 2012), culture of trust (Larrivee, 2000), coaching (Borg, 2011), and PLCs (Allen & Penuel, 2015) allows teachers to engage in increased questioning, sharing, and discussions with self, and others, resulting in increased reflective practice. The reflective practice further enables teachers to challenge their conclusions, generate new understandings and knowledge, and approach new issues (Ng & Tan, 2009; Shabeeb & Akkary, 2014). Additionally, teacher reflection is recognized in literature as an accepted means to access teachers' beliefs (Pajares, 1992; Richardson, 2003), and consequently influence their teaching practices (Chan et al., 2007; Doruk, 2014).

Data for this construct was gathered from (a) the teachers' responses after the workshops, documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings obtained from audio recordings of sessions, and documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher practices in PLC spaces, collected from video recordings of sessions (see Appendix I), and documented session logs on the school's Google drive. Additional data from the teacher interviews was used to determine if exposure to the workshops, PLCs, and coaching sessions contributed to increased teacher reflective practices. Example interview questions included: "How have the workshops' content & format contributed to your reflective practices", "How have the PLCs' content & format contributed to your reflective practices", and "How has the coaching with your language coordinator sessions' contributed to your reflective practices"? The interview questions are in Appendix G.

Teacher awareness of beliefs and discrepancies between beliefs and practices.

Researchers have recognized that the process of changing one's beliefs is gradual, and this process is initiated by an individuals' awareness of their beliefs, and the disparity between their beliefs and actions (Farrell & Ives, 2015; Tillema, 2000). Teacher reflection is recognized in literature as an accepted means to access teachers' beliefs (Pajares, 1992; Richardson, 2003), and consequently influence their teaching practices (Chan et al., 2007; Doruk, 2014). Data for this construct was gathered from (a) the teachers' responses after the workshops, documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings obtained from audio recordings of sessions, and documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher practices in PLC spaces, collected from video recordings of sessions (see Appendix I), and

documented session logs on the school's Google drive. Additional data from the teacher interviews was used to determine if exposure to the workshops, PLCs, and coaching sessions contributed to increased teachers' awareness of beliefs and discrepancies between beliefs and practices. Example interview questions included: "How have the workshops' content & format contributed to your awareness of beliefs and discrepancies between beliefs and practices", "How have the PLCs' content & format contributed to your awareness of beliefs and discrepancies between beliefs and practices", and "How has the coaching with your language coordinator sessions' contributed to your awareness of beliefs and discrepancies between beliefs and practices"? The interview questions are in Appendix G.

Teachers' perception of knowledge and skill about constructivist teaching. Workshops that focus on specific subject related matter, namely, language, methods and strategies required for teaching, knowledge about the learner, the learning process, and pedagogical content knowledge (Jeanpierre et al., 2005), helps increase teachers' knowledge and skills (Jeanpierre et al., 2005; Penuel et al., 2007). Additionally, teachers' active engagement in inquiry (Dufour & DuFour, 2013), and the collaborative study of pedagogy in the PLC will assist teachers in collective sensemaking of the content (Gersten et al., 2010; Pella, 2011*)*. Moreover, the coaching facilities supports teachers' in clarifying, examining and developing their frameworks about teaching and learning (Borg, 2011; Fives & Buehl, 2008; Larrivee, 2000), and provide teachers with continual feedback as teachers experiment with new knowledge (Helsing et al., 2008).

Data for this construct was gathered from (a) the teachers' responses after the workshops, documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings obtained from audio recordings of sessions, and documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher

practices in PLC spaces, collected from video recordings of sessions (see Appendix I), and documented session logs on the school's Google drive. Additional data for this construct was collected during teachers' interviews. The example interview questions included, "How have the workshops' content & format contributed to your knowledge and skill about learning and teaching", "How have the PLCs' content & format contributed to your knowledge and skill about learning and teaching", and ""How has the coaching with your Language coordinator sessions' contributed to your knowledge and skill about learning and teaching"? The interview questions are in Appendix G.

Teacher beliefs. Beliefs are defined as a set of personal conceptual constructs that signify to its holder a reality (Fang, 1996; Pajares, 1992, as cited in Lee, Zhang, Song, & Huang, 2013). Teacher beliefs influence teacher's decision-making in the classroom and drive their instructional pedagogy (Fang, 1996; Pajares, 1992; Richardson, 1996). In this study, this construct was operationalized through the Teacher Beliefs Scale (TBS) Questionnaire by Woolley et al. (2004), based on an extensive literature review related to the behaviorist and constructivist theories, for assessing the beliefs of teachers related to constructivist and traditional approaches to teaching and learning. It contains 21 items in three constructs, namely, Traditional Management (TM). Traditional Teaching (TT), and Constructivist Teaching (CT), and uses a 6-point rating scale ranging from 1 (strongly disagree) to 6 (strongly agree).

Woolley (2004) has confirmed the reliability and validity of the scale with Cronbach's alpha reliability coefficients for different constructs (n=896) as, Traditional Management (.52), Traditional Teaching (.78), and Constructivist Teaching (.73). Cronbach's α computed from the factor analysis of the survey's scale items was .78. A correlation analysis between scales was used to assess the construct validity. Results from the analysis indicated positive correlations between the different traditional teaching scales while a

negative correlation was found between traditional and constructivist descriptors. The survey is presented in Appendix C. The face validity of the Teacher Belief Scale (Woolley et al., 2004) reveals that the items on this scale mainly captures teachers' self-reports of practices rather than beliefs. Further, since it a self-reporting instrument, it is likely that participants' responses will reflect what they feel is ideal, expected, or socially desirable. As a result, the responses may express what the teachers want the researchers to know rather than their actual beliefs, in the attempt to be perceived favorably by the researcher. Additionally, beliefs elicited on a scale do not reflect teachers' practices in the classroom.

Additional data for this construct was gathered from (a) the teachers' responses after the workshops, documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings obtained from audio recordings of sessions, and documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher practices in PLC spaces, collected from video recordings of sessions (see Appendix I), and documented session logs on the school's Google drive. Also, data from the teacher interviews was used to determine if exposure to the workshops, PLCs, and coaching sessions contributed to teachers' beliefs about teaching and learning. Example interview questions included: "How have the workshops' content & format contributed to your ideas or beliefs about teaching and learning", "How have the PLCs' content & format contributed to your ideas or beliefs about teaching and learning", and "How has the coaching with your language coordinator sessions' contributed to your ideas or beliefs about teaching and learning"?

Additional data from the teacher interviews was used to determine if the short-term outcomes (increased reflective practices, increased awareness of beliefs, and discrepancy between beliefs and practices, and increased knowledge and skill) contributed to changing their beliefs. The example interview questions included, "How have increased reflective

opportunities contributed to your ideas or beliefs about learning and teaching", "How has increased awareness of your beliefs and the discrepancies between your beliefs, and practices contributed to your ideas or beliefs about teaching and learning", and "How has the additional knowledge and skill obtained during PD contributed to your ideas or beliefs about teaching and learning"? The interview questions are in Appendix G.

Teacher efficacy. Teacher efficacy is defined as ''beliefs in one's capacity to organize and execute the courses of action required to produce given attainments'' (Bandura, 1977; Hoy & Spero, 2005). Further it is defined as the teacher's confidence in his/her ability to promote student learning (Bandura, 1977). The Teacher Efficacy Scale (Gibson & Dembo, 1984), a validated construct related to student outcomes was used for this construct during the intervention. Gibson and Dembo (1984) use a six-point Likert format from "strongly agree" to "strongly disagree" on a 30 statement instrument comprising of two subscales, personal teaching efficacy (PTE), and general teaching efficiency (GTE). The researchers conducted a factor analysis on 208 schoolteachers' responses on the scale, and found that the two factors explained 29% of total variance. They chose nine items that loaded most heavily on personal efficacy factor, and seven items that loaded most heavily on teaching efficacy factor, resulting in a total of 16 items. In their study, Gibson & Dembo, (1984) found that the PTE and GTE factors were essentially uncorrelated ($r = .19$). An analysis of internal consistency reliabilities using Cronbach's alpha coefficients for the 16-item scale was .78 for Personal Teaching Efficacy, and .75 for Teaching Efficacy Factor. The results demonstrate that the Teacher Efficacy Scale includes two discernible factors, and hence is multidimensional. This aligns to Bandura's (1977) concept of self-efficacy, and verifies the notion of teacher efficacy by Ashton and Webb (1982).

Bandura suggested that behaviour is influenced by general outcome expectancy such that behaviour results in desirable outcomes, and self-efficacy such that an individual

possesses the skill to create the outcome. In terms of teacher efficacy, outcome expectancy includes the extent to which students can be taught regardless of other aspects such as socioeconomic status, backgrounds, and school settings. The Teaching Efficacy factor (Gibson & Dembo, 1984) aligns to the outcome expectancy. On the other hand, the Personal Teaching Efficacy factor relates to the self-efficacy aspect, which suggests the teacher's ratings of personal abilities to complete tasks that result in student achievement. Additionally, multiple methods used to assess different traits, that is, teacher efficacy, verbal ability, and flexibility, supported both convergent and discriminant validity (Gibson & Dembo, 1984). The scale is seen in Appendix M.

Teachers' classroom practices. Teachers' classroom practices are described within the framework for teaching grounded in a constructivist view of learning and teaching, namely, The Framework for Teaching (Danielson, 2013). This framework was introduced in 1996, and "identifies those aspects of a teacher's responsibilities that have been documented through empirical studies and theoretical research as promoting improved student learning" (Danielson, 1996, p. 1). It is "based on the Praxis III criteria developed by the Educational Testing Service (ETS) after extensive surveys of the research literature, consultation with expert practitioners and researchers, wide-ranging job analyses, summaries of the demands of state licensing programs, and fieldwork" (Danielson, 2007, p. 183). Danielson (2007) explains that a constructivist perspective towards teaching and learning inspires this framework.

This framework utilizes four broad domains, namely, planning and preparation; classroom environment; instruction; and professional responsibility; broken down into 22 components and 76 smaller elements to incorporate the variety of components related to teaching. For this study, teacher pedagogy was measured using only the first three domains, including 16 components. Each component of the instrument has a detailed rubric that is used

to evaluate the teachers on the elements as *unsatisfactory, basic, proficient,* or *distinguished*. A list of the relevant components for each of three domains, along with the observed data, is delineated in the Framework for Teaching Observation Sheet in Appendix B.

The validity of the instrument is demonstrated in different research studies that found teacher practices, measured by teacher evaluation system based on the Framework for Teaching (Danielson, 1996) lead to student achievement. For instance, a study in a large Western school district provided evidence for a statistically significant positive correlation between teacher performances, as measured by the evaluation system based on the Framework for Teaching (Danielson, 1996), and student achievement (Kimball et al., 2004). The positive relationship between teacher evaluation scores and student achievement was further confirmed in another study that evaluated teachers based on a subject-specific adaptation of the Danielson (1996) Framework for Teaching (Gallagher, 2004). Additionally, small to moderate correlations were demonstrated between teacher evaluation scores based on a set of teaching standards rooted in the Framework for Teaching (Danielson, 1996) and student achievement with 0.27 in science, 0.32 in reading, and 0.43 in mathematics (Milanowski, 2004). Additionally, another instrument, The University Supervisors Evaluation Report (USER) was developed based on 22 components in the 4 domains of Danielson's framework. When evaluated in relation to the Danielson's framework, the USER demonstrated high internal consistency reliability within each domain, and high content validity and construct validity (Benjamin, 2002).

Teacher observations, that include measures of observable classroom processes, such as specific teacher practices, holistic aspects of instruction, and interactions between teachers and students are considered one of the most widely forms of teacher evaluation (Goe et al., 2008; Pianta & Hamre, 2009). Additionally, evidence based teacher evaluation systems include multiple time points for classroom observations, use of rubrics that define

instructional improvement on a continuum, links teacher effectiveness to student performance, and demonstrates variation in performance ratings among teachers (Goe et al., 2008). Hence the Danielson instrument used for teacher evaluation in this study, an observational protocol, has high face validity as it incorporates the above-mentioned aspects of evidence based teacher evaluation systems.

Further, data for this construct was gathered from (a) the teachers' responses after the workshops, documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings obtained from audio recordings of sessions, and documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher practices in PLC spaces, collected from video recordings of sessions (see Appendix I), and documented session logs on the school's Google drive. Additional data from the teacher interviews was used to determine if exposure to the workshops, PLCs, and coaching sessions contributed to teachers' classroom practices. Example interview questions included: "How have the workshops' content & format contributed to your current classroom practices", "How have the PLCs' content & format contributed to your current classroom practices", and "How has the coaching with your language coordinator sessions' contributed to your current classroom practices"?

Additional data from the teacher interviews was used to determine if the short-term outcomes (increased reflective practices, increased awareness of beliefs, and discrepancy between beliefs and practices, and increased knowledge and skill) contributed to changing their classroom practices. The example interview questions included, "How have increased reflective opportunities impacted your current classroom practices", "How has increased awareness of your beliefs and the discrepancies between your beliefs, and practices impacted your current classroom practices", and "How has the additional knowledge and skill obtained

during PD impacted your current classroom practices"? A sample of the interview questions is in Appendix G. The interview questions are in Appendix G.

Procedure

Intervention. The modified professional development model at the school was implemented from January to April 2018. Currently, the school under study delivers workshops to the English Language teachers as part of their professional development model during summer. The intervention was a modified professional development model in the academic year 2017-2018 such that all the language teachers at the school were part of the professional development program to effect change in teachers' beliefs and practices (Caudle & Moran, 2012; Guskey, 2002; Murphy et al., 2004). In acknowledging the failure of traditional, workshop models of professional development in impacting change in teacher practices (Darling-Hammond et al., 2009; Desimone et al., 2002; Penuel et al., 2007), the professional development model included three participant driven workshops, in addition to weekly coaching sessions and bi-weekly professional learning communities (PLC) meetings over three months (see Table 4.1).

Additionally, the professional development activities were rooted in constructivist principles such as the use of authentic problems and embedding learning in real contexts, employing a collaborative model, allowing teachers to engage in different modes of representation and modeling, and including reflective opportunities (Ng & Tan, 2009; Shabeeb & Akkary, 2014; Vijaya Kumari, 2014). The teachers' role during the sessions was active as they indulged in inquiry and reflective activities about specific actions, and their beliefs, and attitudes underlying those actions (Spilkova, 2001), resulting in influencing the teachers' knowledge, beliefs, and resulting practices (Borko, 2004; Desimone et al., 2002; Garet et al., 2001; Penuel et al., 2007; (Shabeeb & Akkary, 2014).

Participant Driven Workshops (W). The participant driven workshops targeted both disciplinary and pedagogical knowledge (Bransford et al., 2000) to equip teachers appropriately so as to apply their knowledge more effectively (Neuman & Cunningham, 2009). The list of topics and schedule of the workshops are listed in Appendix H. The workshops were presented in a lecture format, incorporating actual classroom demonstrations and videotapes to display effective instruction. Teachers were also provided with opportunities to apply the knowledge delivered in workshops in simulated activities and group learning formats. The language-focused workshops were delivered using the gradual release of responsibility model (Pearson & Gallagher, 1983), which is demonstrated in research as effective in impacting comprehension achievement (Fisher & Frey, 2007; Kong & Pearson, 2003).

The gradual release of responsibility model consists of four aspects; (1) focus lessons where the teacher presents his or her content understanding, (2) guided instruction that includes teacher prompts, questions, and facilitation to increase learners' content understanding, (3) collaborative learning that involves opportunities to learners to problem solve, discuss, negotiate, and think with their peers, and (4) independent work where learners integrate the knowledge, and establish their new understandings (Fisher & Frey, 2008). The list of topics and teacher reflective prompts after the workshops are in Appendix H. The language coordinator, who is the researcher in this study, conducted all the workshops. At every workshop, members' attendance was recorded.

Professional Learning Communities (PLC). Research has shown that structured meeting spaces that allowed team members to be actively involved are effective in promoting reflections and discussions (Graham, 2007; Little et al., 2003). Additionally, effective PLCs use structures and protocols, in addition to teacher and student work to encourage dialogue, and problem solving among participants, (Little et al., 2003; McDonald, Mohr, Dichter, and

McDonald, 2013). The PLC meeting agenda template in Appendix C was created based on the research findings of effective PLC characteristics listed in the review above. The language coordinator, who was the researcher in the study, led the PLC meeting and the attending members included all the English language teachers at the school under review. The meeting was scheduled on a bi-weekly basis spanning 45 minutes, with allotted time for each aspect on the agenda (Appendix I).

The PLC began with 15 minutes of sharing time where teachers used videos, templates, books, or other resources to demonstrate effective instruction or ideas targeting any aspect of language learning (Pella, 2011; Schechter, 2010). The language coordinator planned this sharing with the teacher, as identified as relevant, during the coaching session. Further, the coordinator used the multiple videos demonstrating teacher practices with diverse students (Brock & Carter, 2015) to encourage discussions among the teachers and hence allowed teachers to engage in greater reflective practices (see Appendix I). After this, the teachers participated in a discussion regarding their study of a pre-decided book or research article related to an identified relevant area of instruction. This collaborative study engaged teachers in collective sensemaking of the content and hence impact effective classroom practices (Pella, 2011; Schechter, 2010*).* The follow-up points from previous meetings were reviewed and discussed further if need be, as it lends itself to stimulate cycles of continuous inquiry (Dufour & DuFour, 2013). Then teachers were updated about relevant programs, policies, or plans, and discussions over matters that require a consultative approach in language instruction, assessment, or events. The language coordinator concluded the meeting by summarizing the main points from the meeting and highlighting the actionable aspects and identified teachers. All the PLC sessions were video recorded so the researcher could have access to the session during data collection.

Coaching (C). Based on the research review above, the coaches observed and modeled instructions in each teacher's current classrooms (Neuman & Cunningham, 2009). In addition to observations, a coaching session between the language coordinator at the school (coach) and each English teacher (participant) were held on a weekly basis for 45 minutes to an hour at the school under review on an ongoing basis through the intervention period (Gulamhussein, 2013; Poglinco & Bach, 2004; Poglinco et al., 2003). Each session was audio recorded, with the participant's prior permission. The meeting time and date was scheduled collaboratively between the coach and the teacher at the start of the intervention.

During the sessions the coaches built rapport and established trust and respect with the teachers (Fives & Buehl, 2008; Larrivee, 2000) while encouraging teachers to implement the strategies in classroom practices and hence build accountability (Brock & Carter, 2015), provided teachers with continual feedback using the 'I see – I think – I wonder' format as teachers experimented with new instructional strategies in the classroom (Helsing et al., 2008), and supported teachers in analyzing their classroom practices (Stephens et al., 2011; Trivette et al., 2014) by using the teachers' reflective journals to engage in reflective practices, asking open-ended questions, generating discussions, and setting goals (Guiney, 2001; Neuman & Cunningham, 2009). Overall, the coach aimed to align the coaching sessions to the knowledge and understandings presented to teachers during the professional development workshops, and ideas generated in PLC meetings. The template used at the coaching session can be seen in Appendix J.

Additional factors – reflection time, duration, supportive leadership. There are several conflicting demands that teachers have to grapple with in the course of the day and hence the school leaders ensured that time for reflection is factored into the teachers' schedule and included across professional development sessions through the intervention period (Guskey, 2002). Further, in order to enlist teacher motivation (Timperley, Wilson,

Barrar & Fung, 2008) and willingness to participate in professional development, the teachers were provided with the rationale for the inclusion of certain activities and structures in the professional development framework along with research supporting the modified aspects. It was expected that teacher buy-in for professional development would be enhanced when teachers were educated about the data from the needs assessment and literature in the field of professional development. Additionally, the modified professional development system was implemented for duration of three months (Batra, 2005; Darling-Hammond et al., 2009) in order to obtain short and medium term results about the impact of intervention. Lastly, a strong leadership buy-in ensured that teachers have the required assistance needed during professional development, and the professional development system was consistently adhered to through the year.

Table 4.1:

The timeline for professional development intervention in the academic year 2017 - 2018

Month	Professional Development Sessions
January	W: 1 + C: weekly + PLC: biweekly
February	W: 1 + C: weekly + PLC: biweekly
March	W: 1 + C: weekly + PLC: biweekly

Note. *W – Workshops **C – Coaching ***PLC – Professional Learning Community

Table 4.2:

Alignment between different components of PD and constructivist theory

PD Components	Components of constructivist theory
Participant driven workshops	• Includes videos of actual classroom demonstrations & models of effective teacher instructions • Use of authentic problems in simulated activities • Allows for collaboration through group work opportunities • Demands active participation of teachers through use of gradual release of responsibility model • Includes opportunities for reflection
Professional Learning Community Meetings	• Includes videos of actual classroom demonstrations & models of effective teacher instructions • Use of structures (pair and group work) and protocols to encourage teacher discussions and collaboration

	• Use of multiple modes of instruction (videos, books, templates) • Includes opportunities for video reflections using prompts • Includes collaborative study of relevant research articles and books • Promotes problem solving related to current, authentic problems • Involves active participation of members (discussions, and reflections related to classroom instructions)
Coaching	• Promotes teacher reflections by using the "I see, I think, I wonder" format • Involves active participation of members through discussions about classroom instructions and building in accountability • Includes modeling and observations in real classroom contexts • Promotes problem solving related to authentic classroom instructions

Data collection.

The primary focus of quantitative data aims to examine the extent to which the intervention leads to the short-term outcomes (increased teacher reflective practices, increased awareness of beliefs, and discrepancy between beliefs, and practices, and increased teacher knowledge, and skill about constructivist practices) and medium term outcomes (improved teacher classroom practices, increased teachers' constructivist beliefs, increased teachers' efficacy, and increased alignment between teachers' beliefs, and practices). Using the embedded design, the researcher first implemented the qualitative strand (Creswell & Plano Clark, 2011), by collecting open-ended data, and then analyzed the qualitative data for themes. Therefore, the teachers' qualitative interview data was used to understand the process of the intervention that is how the process changed the teachers' beliefs, and practices, and students' outcomes.

Process evaluation.

Structures (time, technology, spaces for meetings). The data for structures related to time and space was collected from Google calendar on a monthly basis. The data from the professional development facilitator was used to determine the availability of technological resources during professional development sessions (workshops, PLC, and coaching). This data was used to determine the availability of time, technology, and space for meetings.

Participants' attendance at meetings. The investigator accessed this data on a monthly basis from the session logs documented on the schools' Google drive. This data was used to record the number of professional development sessions (workshops, PLC, coaching) attended by each English teacher.

Frequency, and duration of meetings. This data was accessed from the documented session logs on the school's Google drive on a monthly basis. This data was used to record the number of professional development sessions (workshops, PLC, coaching) provided at the school.

Culture of trust at the school. The data for this factor was obtained from the anonymous teacher survey results conducted by the school every year related to school culture. The data was then be used to determine the extent to which the culture of trust exists in the school.

Use of inquiry and reflective practices. The school's Google drive documented session logs on a monthly basis was accessed to determine the number of professional development sessions (workshops, PLC, and coaching) that included reflective questions.

Participant-driven workshops. The data for the delivery of the workshops was retrieved from the documented session logs from the school's Google drive on a monthly basis.

Professional learning community. The documented session logs from the school's Google drive, and video recordings of the sessions on a monthly basis were collected to determine the delivery of the PLCs.

Coaching. The data for the delivery of the coaching sessions was retrieved from the documented session logs from the school's Google drive, and the audio recorded sessions on a monthly basis.

Outcome evaluation.

Increased teachers' reflective practices. In order to assess if exposure to professional development lead teachers to adopt more reflective practices, the data from (a) teachers' responses after the workshops, and documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings from audio recordings, and as documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher practices in PLC spaces, as documented session logs on the school's Google drive, and video recordings of sessions (see Appendix I) were gathered to determine the teacher's reflective practices throughout the intervention. Additional data from the teacher interviews was used to determine if exposure to the workshops, PLCs, and coaching sessions contributed to increased teacher reflective practices. Example interview questions included: "How have the workshops' content & format contributed to your reflective practices", "How have the PLCs' content & format contributed to your reflective practices", and "How has the coaching with your language coordinator sessions' contributed to your reflective practices"? The interview questions are in Appendix G.

Teacher awareness of beliefs and discrepancies between beliefs and practices. In order to determine if exposure to professional development lead teachers to increase awareness of beliefs, and discrepancies between beliefs, and practices, the data from (a)

teachers' responses after the workshops, and documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings from audio recordings, and as documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher practices in PLC spaces, as documented session logs on the school's Google drive, and video recordings of sessions (see Appendix I) were accessed.

Additional data from the teacher interviews was used to determine if exposure to the workshops, PLCs, and coaching sessions contributed to increased teachers' awareness of beliefs and discrepancies between beliefs and practices. Example interview questions included: "How have the workshops' content & format contributed to your awareness of beliefs and discrepancies between beliefs and practices", "How have the PLCs' content & format contributed to your awareness of beliefs and discrepancies between beliefs and practices", and "How has the coaching with your language coordinator sessions' contributed to your awareness of beliefs and discrepancies between beliefs and practices"? The interview questions are in Appendix G.

Teachers' perception of knowledge and skill about constructivist teaching. To understand if exposure to professional development led teachers to increase their perception of knowledge and skill about constructivist teaching, the data from (a) teachers' responses after the workshops, and documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings from audio recordings, and as documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher practices in PLC spaces, as documented session logs on the school's Google drive, and video recordings of sessions (see Appendix I) were retrieved.

Data for this construct was also collected during teachers' interviews. The example interview questions included, "How have the workshops' content & format contributed to your knowledge and skill about learning and teaching", "How have the PLCs' content & format contributed to your knowledge and skill about learning and teaching", and "How has the coaching with your language coordinator sessions' contributed to your knowledge and skill about learning and teaching"? The interview questions are in Appendix G.

Teacher beliefs. The data for each teacher on the Teacher Belief Survey (Woolley et al., 2004) was arranged according to the items that defined the traditional approach (Items 1, 11, 12, 20, 5, 6, 8, 9, 15, 17, 19) and items that belonged to the constructivist approach (Items 2, 3, 4, 7, 10, 13, 14, 16, 18, 21). An average score for each teacher's traditional and constructivist approach was calculated and compared to determine which teacher exhibited a more traditional or constructivist approach. The teacher's scores were then compared to their belief scores obtained during the needs assessment to determine if there was a shift in the scores towards a more constructivist approach.

Additional data for this construct was gathered from (a) the teachers' responses after the workshops, documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings obtained from audio recordings of sessions, and documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher practices in PLC spaces, collected from video recordings of sessions (see Appendix I), and documented session logs on the school's Google drive.

Moreover, data from the teacher interviews was used to determine if exposure to the workshops, PLCs, and coaching sessions contributed to teachers' beliefs about teaching and learning. Example interview questions included: "How have the workshops' content & format contributed to your ideas or beliefs about teaching and learning", "How have the

PLCs' content & format contributed to your ideas or beliefs about teaching and learning", and "How has the coaching with your language coordinator sessions' contributed to your ideas or beliefs about teaching and learning?"

Additional data from the teacher interviews was used to determine if the short-term outcomes (increased reflective practices, increased awareness of beliefs, and discrepancy between beliefs and practices, and increased knowledge and skill) contributed to changing their beliefs. The example interview questions included, "How have increased reflective opportunities contributed to your ideas or beliefs about learning and teaching", "How has increased awareness of your beliefs and the discrepancies between your beliefs, and practices contributed to your ideas or beliefs about teaching and learning", and "How has the additional knowledge and skill obtained during PD contributed to your ideas or beliefs about teaching and learning?" The interview questions are in Appendix G.

Teacher efficacy. The researcher administered the Teacher Efficacy Survey twice, before and after the intervention. The data for each teacher on the Teacher Efficacy Survey (Gibson & Dembo, 1984) was arranged according to the items that define Personal Teaching Efficacy (Items 1, 12, 14, 15, 19, 21, 24, 25, 29), and General Teaching Efficacy (Items 2, 4, 6, 16, 23, 27, 30). The scoring of the scale can be seen in Appendix L. An average pre and post intervention score for all teachers' personal, general, and total teaching efficacy was calculated. From these scores, the average changed score between the pre and post intervention score for all teachers' personal, general, and total teaching efficacy was calculated. Further, the changed score from pre to post intervention for each teacher was used to calculate the average of the changed score for personal, general, and total teaching efficacy. Lastly, an item analysis was conducted where each teacher's score on each item was used to calculate the percentage of teachers whose scores had increased, decreased, and stayed the same for each item.

Teachers' classroom practices. The researcher evaluated nine language teachers' performance over 60 minute lessons using the first three domains; planning and preparation, classroom environment, and instruction; of the Framework for Teaching evaluation system (Danielson, 1996) twice; before and after the intervention. Each teacher's score for each indicator (Unsatisfactory, Basic, Proficient, Distinguished) across the 16 components on the framework was measured for both the observations. The percentage of teachers on each indicator from the pre-intervention observation were then compared to the percentage of teachers on the same framework during the post-intervention in order to check if there was an increase in their percentage scores for different indicators (Unsatisfactory, Basic, Proficient, Distinguished). Further, the percentage of teachers on the different domains, that is, planning and preparation, classroom environment, and instruction was calculated. These post-intervention percentages across the domains were compared to their percentages on the pre-intervention in order to check if there was an increase in their percentage scores across different indicators (Unsatisfactory, Basic, Proficient, Distinguished) on the different domains (planning and preparation, classroom environment, and instruction). Lastly, the total scores of all teachers, and the percentage of teachers on different indicators (Unsatisfactory, Basic, Proficient, Distinguished) on each of the 16 components were calculated. Additionally, a total weighted score for pre and post intervention on each of the 16 components, and the resulting improved score from pre to post intervention was also calculated.

Additional data for this construct was gathered from (a) the teachers' responses after the workshops, documented in the school's Google drive logs on a monthly basis through the intervention period (see Appendix H), (b) teachers' responses during coaching meetings obtained from audio recordings of sessions, and documented session logs on the school's Google drive (see Appendix J), and (c) discussions surrounding videos demonstrating teacher

practices in PLC spaces, collected from video recordings of sessions (see Appendix I), and documented session logs on the school's Google drive.

Additional data from the teacher interviews was used to determine if exposure to the workshops, PLCs, and coaching sessions contributed to teachers' classroom practices. Example interview questions included: "How have the workshops' content & format contributed to your current classroom practices", "How have the PLCs' content & format contributed to your current classroom practices", and "How has the coaching with your language coordinator sessions' contributed to your current classroom practices"?

Data from the teacher interviews was also used to determine if the short-term outcomes (increased reflective practices, increased awareness of beliefs, and discrepancy between beliefs and practices, and increased knowledge and skill) contributed to changing their classroom practices. The example interview questions included, "How have increased reflective opportunities impacted your current classroom practices", "How has increased awareness of your beliefs and the discrepancies between your beliefs, and practices impacted your current classroom practices", and "How has the additional knowledge and skill obtained during PD impacted your current classroom practices"? The interview questions are in Appendix G.

Table 4.3:

Summary of Data Collection in the year 2017 - 2018

Data Collection Components	Tools	Formative / Summative
Structures (time, space, technology for meetings)	Google calendar & interview	Formative
Participants' attendance at meetings	Google drive	Formative
Frequency, and duration of meetings	Google drive	Formative
Culture of trust at the school	Survey	Summative
Use of inquiry and reflective practices	Google drive	Formative

Delivery of participant-driven workshops	Google drive	Formative
Impact of participant-driven workshops	Teachers' interviews	Summative
Delivery of professional learning community meetings	Google drive	Formative
Impact of professional learning community meetings	Teachers' interviews	Summative
Delivery of coaching	Google drive	Formative
Impact of coaching	Teachers' interviews	Summative
Increased teachers' reflective practices	Teachers' journals, teacher's responses in coaching & PLCs	Formative & Summative
Teacher awareness of beliefs and discrepancies between beliefs and practices	Teachers' journals, teacher's responses in coaching & PLCs	Summative
Teacher knowledge and skill about constructivist teaching	Teacher interviews	Summative
Teacher beliefs	Teacher Belief Survey, teachers' journals, teacher's responses in coaching & PLCs, & teacher interviews	Summative
Teachers' classroom practices	Framework for Teaching evaluation system, teachers' journals, teacher's responses in coaching & PLCs, & teacher interviews	Summative

Data analysis.

In order to portray a minimal detectable effect size of the intervention, a sample range (n=21 to n=75) of teacher participants (treatment and control) was required to have an acceptable power of 0.80 and α=0.5 as determined using G-power. Since there is a mismatch between the required sample range (n=21 to n=75), and that, which was feasible in the school under study (n=9), and lack of other available statistics for qualitative data, descriptive

statistics was used in this study to analyze the data. More specifically, descriptive statistics was used overtime to assess if teachers' beliefs and practices changed from pre to posttest. However, using descriptive analysis can be considered a limitation, as descriptive statistics does not indicate if the change between pre and posttest had been a result of the intervention, and hence the outcome could be attributed to other competing variables in the study.

Research Question 1: To what extent did the professional development provide members with participant driven workshops, coaching facilities, professional learning community meeting spaces, reflective practices, structures (space and time), and a culture of trust on an ongoing basis through the intervention period?

a. To what extent did members participate in professional development sessions, including participant driven workshops, coaching meetings, and professional learning community meetings?

Participant-driven workshops. The data for the delivery of the workshops was retrieved from the documented session logs from the school's Google drive on a monthly basis. Descriptive data demonstrated if all sessions were delivered as planned. Hence, the description included high or low fidelity with respect to adherence and dosage.

Professional learning community. The documented session logs from the school's Google drive, and video recordings of the sessions were collected on a monthly basis to determine the delivery of the PLCs. Thus, PLC sessions were described in terms of high and low fidelity with regard to adherence and dosage of sessions.

Coaching. The data for the delivery of the coaching sessions was retrieved from the documented session logs from the school's Google drive, and audio recordings of sessions on a monthly basis. Descriptive data demonstrated high or low fidelity with regard to adherence and dosage of coaching sessions.

Use of reflective practices. The school's Google drive documented session logs; audio and video recordings of sessions on a monthly basis were accessed to determine the number of professional development sessions (workshops, PLC, and coaching) that included reflective questions. Descriptive data demonstrated if all sessions included reflective practices as planned.

Structures (time, technology, spaces for meetings). The data for structures related to time and space were collected from Google calendar on a monthly basis. The data from the professional development facilitator was used to determine the availability of technological resources during professional development sessions (workshops, PLC, and coaching). Descriptive data demonstrated if time, technology, and spaces for all sessions were available as planned.

Culture of trust at the school. The data for this factor was obtained from the anonymous teacher survey results conducted by the school every year related to school culture. Descriptive data demonstrated if the culture of trust at the school was present.

Members' participation at PD sessions. The data for the members' attendance at the professional development sessions, including workshops, PLCs, and coaching meetings, were retrieved from the documented session logs from the school's Google drive, and audio and video recordings of the sessions on a monthly basis. Descriptive data was used to describe the level of implementation. Hence, the teachers' attendance was described in terms of percentage of teachers who had high and low fidelity with respect to participant responsiveness.

Research Question 2: How did teachers' exposure to professional development lead teachers to adopt more reflective practices, increase their awareness of beliefs and discrepancies between their beliefs and practices, and increase their perceptions of knowledge and skills in constructivist teaching and learning?

Teachers' reflective practices. The data from the documented session logs on the school's Google drive, and audio and video recordings of sessions was used to access the teachers' workshop reflections, teachers' responses during coaching meetings, and teachers' discussions surrounding videos demonstrating teacher practices in PLC spaces. Additional data from teacher's interviews to examine the impact of different components of professional development (workshops, coaching, and PLCs) on the short-term outcome, namely, increases in teachers' reflective practices were obtained. All the data was coded and analyzed using descriptive statistics to examine the increase in teachers' reflections.

Teachers' awareness of beliefs, and discrepancies between their beliefs and practices. The data from the documented session logs on the school's Google drive, and audio and video recordings of sessions was used to access the teachers' workshop reflections, teachers' responses during coaching meetings, and teachers' discussions surrounding videos demonstrating teacher practices in PLC spaces. Further the teachers' interview data was also transcribed and recorded. All the data were coded to examine the impact of different components of professional development (workshops, coaching, and PLCs) on the teachers' identification of their beliefs, and discrepancies between their beliefs and practices.

Teachers' perception of knowledge and skills regarding constructivist teaching and learning. The data from the documented session logs on the school's Google drive, and audio and video recordings of sessions was used to access the teachers' workshop reflections, teachers' responses during coaching meetings, and teachers' discussions surrounding videos demonstrating teacher practices in PLC spaces. Additionally, The teachers' interview data was also transcribed and recorded. All the teacher responses were coded and analyzed to examine the impact of different components of professional development (workshops, coaching, and PLCs) on the short-term outcome, namely, the teachers' perception of knowledge and skills regarding constructivist teaching and learning.

Research Question 3: How did teachers' exposure to the professional development and the short-term outcomes (i.e. increase in teachers' 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, and 3) perceptions of knowledge and skills in constructivist practices) change their beliefs about teaching, their efficacy, instructional practices in the classroom, and the alignment between their beliefs and practices?

Teacher beliefs. The data from the Teacher Belief Survey (Woolley et al., 2004) for each teacher was arranged according to the items that defined the traditional approach (Items 1, 11, 12, 20, 5, 6, 8, 9, 15, 17, 19) and items that belonged to the constructivist approach (Items 2, 3, 4, 7, 10, 13, 14, 16, 18, 21). An average score for each teacher's traditional and constructivist approach was calculated and compared to determine which teacher exhibits a more traditional or constructivist approach. The teacher's scores were then compared to their belief scores obtained during the needs assessment to determine if there was a shift in the scores towards a more constructivist approach. The data was analyzed using descriptive statistics to examine the change in teachers' beliefs over time.

The data from the documented session logs on the school's Google drive, and audio and video recordings of sessions will be used to access and code the teachers' workshop journal reflections, teachers' responses during coaching meetings, and teachers' discussions surrounding videos demonstrating teacher practices in PLC spaces to examine the changes in teacher's beliefs about learning and teaching. Also, the teachers' interview data was transcribed and coded to examine the impact of different components of professional development (workshops, coaching, and PLCs) on the teacher's beliefs about learning and teaching. Additionally, the interview data will be coded to determine the extent to which each short-term outcome (teacher's reflective opportunities, awareness of beliefs and discrepancies between beliefs and practices, and additional skill and knowledge obtained from PD) contributed to the teacher's beliefs about learning and teaching.

Teacher efficacy. The data for each teacher on the Teacher Efficacy Survey (Gibson & Dembo, 1984) was arranged according to the items that define Personal Teaching Efficacy (Items 1, 12, 14, 15, 19, 21, 24, 25, 29), and General Teaching Efficacy (Items 2, 4, 6, 16, 23, 27, 30). The scoring of the scale can be seen in Appendix L. An average pre and post intervention score for all teachers' personal, general, and total teaching efficacy was calculated. From these scores, the average changed score between the pre and post intervention score for all teachers' personal, general, and total teaching efficacy was calculated. Further, the changed score from pre to post intervention for each teacher was used to calculate the average of the changed score for personal, general, and total teaching efficacy. Lastly, an item analysis was conducted where each teacher's score on each item was used to calculate the percentage of teachers whose scores had increased, decreased, and stayed the same for each item.

Teachers' classroom practices. The researcher evaluated nine language teachers' performance over 60 minute lessons using the first three domains; planning and preparation, classroom environment, and instruction; of the Framework for Teaching evaluation system (Danielson, 1996). Each teacher's score for each indicator (Unsatisfactory, Basic, Proficient, Distinguished) across the 16 components on the framework was measured for both the observations. The percentage of teachers on each indicator from the pre-intervention observation were then compared to the percentage of teachers on the same framework during the post-intervention in order to check if there was an increase in their percentage scores for different indicators (Unsatisfactory, Basic, Proficient, Distinguished). Further, the percentage of teachers on the different domains, that is, planning and preparation, classroom environment, and instruction was calculated. These post-intervention percentages across the domains were compared to their percentages on the pre-intervention in order to check if there was an increase in their percentage scores across different indicators (Unsatisfactory, Basic,

Proficient, Distinguished) on the different domains (planning and preparation, classroom environment, and instruction). Lastly, the total scores of all teachers, and the percentage of teachers on different indicators (Unsatisfactory, Basic, Proficient, Distinguished) on each of the 16 components were calculated. Additionally, a total weighted score for pre and post intervention on each of the 16 components, and the resulting improved score from pre to post intervention was also calculated. Further, these teacher's scores on this framework during pre and post-intervention will be compared to their average scores on the same framework during the needs assessment in order to check if there is an increase in their average scores.

The data from the documented session logs on the school's Google drive, and audio and video recordings of sessions will be used to access and code the teachers' workshop journal reflections, teachers' responses during coaching meetings, and teachers' discussions surrounding videos demonstrating teacher practices in PLC spaces to determine the changes in teacher's classroom practices. Also, the teachers' interview data was transcribed and coded to examine the impact of different components of professional development (workshops, coaching, and PLCs) on the teacher's classroom practices. Additionally, the interview data will be coded to determine the extent to which each short-term outcome (teacher's reflective opportunities, awareness of beliefs and discrepancies between beliefs and practices, and additional skill and knowledge obtained from PD) impacted the teacher's classroom practices.

Alignment between teachers' beliefs and practices. The quantitative scores of teachers on the Teacher Belief Survey and the Danielson Framework for Teaching are compared to determine the extent of the relationship between the two.

Summary Matrix.

The summary matrix (see Appendix K) indicates research questions, indicators, data sources, and frequency. This matrix is an overview of the components of evaluation, including process and outcome evaluations. The instruments mentioned in the matrix are

included in the appendices. The evaluation determined whether there was an effect of a professional development model rooted in constructivist principles (Ng & Tan, 2009; Shabeeb & Akkary, 2014; Vijaya Kumari, 2014), and offering reflective opportunities to participants (Caudle & Moran, 2012; Farrell & Ives, 2015; Schön, 1983; Yang, 2009) through (a) participant-driven workshops, (b) professional learning community meetings, and (c) coaching sessions provided over three months on teachers' beliefs and practices in an Indian context.

Trustworthiness

Lincoln and Guba's 1985 criteria (1994) for trustworthiness were used to enhance the credibility of the results from this study. In order to establish credibility, which refers to the confidence in the reported findings, three techniques were used, namely, triangulation, researcher's reflective journal, and member checks. Triangulation or the use of several data sources, including data from teachers' reflective logs, responses during coaching, discussions during professional learning community spaces, and teacher interviews were used to offshoot the weaknesses of the individual methods and determine overall confidence in data findings. Triangulation also established the confirmability of the findings, as use of multiple methods resulted in reduction of researcher bias. In addition, the researcher maintained a reflective journal through the intervention to record her subjectivities, biases, notions, and beliefs related to methods, decisions, and inferences that are significant in determining credibility. Any evolving patterns were used while discussing the result findings of the study. The reflective journal also addressed the confirmability of the findings, which reflects that the findings are not the result of researcher biases and interests, but rather a reflection of data collected from the participants. Lastly, member checks were used to determine the correctness of the data obtained during teacher interviews, coaching, and professional learning community spaces. The coaching sessions' audio recordings were transcribed and

checked with participants to ensure that their words matched their intentions, and also to determine accuracy of emerging patterns and inferences based on data collected.

In order to establish transferability, which includes the generalizability of the findings to other contexts, thick descriptions related to the study context, participants, data collection tools, the number, and duration of data collection sessions, and time frame during which data was collected were provided. This description can be used by other individuals in determining the use of these findings in other contexts. In focusing on the issue of dependability, to demonstrate the consistency of findings when repeated in the same context with the same participants, tools and methods, an audit trail was provided to allow for a complete understanding of the methods and their effectiveness. This included a description of the research design and implementation, and the particulars related to data collection.

CHAPTER 5 – FINDINGS AND DISCUSSIONS

Findings

Research Question 1: To what extent did the professional development provide members with participant driven workshops, coaching facilities, professional learning community meeting spaces, reflective practices, structures (space and time), and a culture of trust on an ongoing basis for the intervention period?

a. To what extent did members participate in professional development sessions, including participant driven workshops, coaching meetings, and professional learning community meetings?

To assess the extent to which professional development provided members with participant driven workshops, coaching facilities, professional learning community meeting spaces, reflective practices, structures (space and time), and a culture of trust on an ongoing basis for the intervention period, the data from the documented session logs from the school's Google drive on a monthly basis was accessed. In the study, high fidelity refers to 95% to 100% delivery of sessions, whereas low fidelity indicates less that 80% of sessions delivered as proposed. Table 5.1 depicts the delivery of the professional development sessions. With regard to dosage of the sessions, table 5.1 illustrates that all workshop sessions were delivered as planned. Therefore, 100% of workshop sessions were delivered according to the proposed time, duration, and frequency during the intervention period, signifying high fidelity. Furthermore, it can be seen that one PLC meeting was not delivered to the teachers. The pre-planned PLC meet at the school was cancelled due to another school event that was scheduled during the same time at short notice. As a result, it is observed that a total of four out of the five possible (80%) notice PLC sessions were delivered. Hence, the delivery of the PLC sessions did not meet the criteria for high or low fidelity in terms of dosage of sessions. It can be concluded that the delivery of the PLC sessions was medium high. Lastly, 73 out of

a total of 77 coaching sessions were delivered across the seven participants. One coaching session was cancelled with each of the three teachers due to a school event that was unexpectedly scheduled during the time planned for the coaching meet. Also, one coaching session was cancelled due to an unforeseen school closing. So, the total percentage of coaching sessions incorporated into professional development was 94.81%, which is considered as high fidelity.

Furthermore, the school's Google drive documented session logs and audio and video recordings of sessions on a monthly basis were accessed to determine the number of professional development sessions (workshops, PLC, and coaching) that included reflective questions, modeling, and inquiry. Data from the documented session logs reveals that reflective and inquiry opportunities and modeling were provided within all sessions. Therefore, there was high fidelity with regard to adherence of sessions. Additionally, the school's Google calendar revealed that time and space for all professional development sessions were allocated. The professional development facilitator also confirmed the availability of technological resources during all workshop, PLC, and coaching sessions. Also, the anonymous teacher survey results conducted by the school every year related to school culture demonstrated that 100% of the teachers considered the school environment safe and trusted their peers and leaders.

In conclusion, it can be said that there was high fidelity with regard to delivery of workshops, and coaching sessions, and medium high fidelity for PLC sessions. Furthermore, since professional development sessions provided participants with modeling, reflective and inquiry practices, structures (space and time), and a culture of trust, it can be considered high fidelity with respect to adherence of sessions.

Fidelity was also described in terms of the teacher's participation at the professional development sessions, including participant-driven workshops, PLCs, and coaching meetings

(Table 5.2). In the study, the sample included nine Language teachers from the school under study. Further, 95% - 100% participant attendance at the different professional development sessions was regarded as high fidelity and less than 80% teacher attendance at more than 10% of the professional development sessions was considered low fidelity. During the study, two teachers unexpectedly quit school in the middle of the academic year due to some unanticipated personal reasons. Hence, data for only seven teachers were considered in the final analysis. It can be seen from Table 5.2 that the total teacher participation at the professional development sessions was 91.94%, which can be considered medium high. Further, the data in the table demonstrates that the range of teacher's percentage attendance at the sessions was from 82% to 100%. All the teachers' percentage attendance at the sessions were above 82%, which can be considered as medium high fidelity.

Table 5.1:

Delivery of the professional development sessions, including participant-driven workshops, PLCs, and coaching meetings.

PD Session	Sessions delivered / Total Sessions	Percentage
Workshops	3 / 3	100%
PLCs	4 / 5	80%
Coaching Meets	73 / 77	94.81%

Table 5.2:

Teacher's total and percentage attendance at professional development sessions, including participant-driven workshops, PLCs, and coaching meetings.

Teachers	Total Attendance (workshops, PLCs, coaching sessions)	Percentage Attendance (workshops, PLCs, coaching sessions)
I. Chugh	16 / 18	88.89
E. Shah	16 / 18	88.89
S. Nataraj	17 / 18	94.44
T. Jha	17 / 17	100.00
M. Rehman	17 / 18	94.44
R. Walia	14 / 17	82.35
J. Reddy	17 / 18	94.44
Total	114 / 124	91.94

Research Question 2: How did teachers' exposure to professional development lead teachers to adopt more reflective practices, increase their awareness of beliefs and discrepancies between their beliefs and practices, and increase their perceptions of knowledge and skills in constructivist teaching and learning?

Reflective Practices

In order to understand the influence of exposure to PD on teachers' reflective practices, teachers' responses during the workshop, PLC and coaching sessions, as well as data from the teacher's interviews were coded for "reflection'. Researchers have defined reflection as a process of self-observation and self-evaluation that requires the teacher to participate in a systematic, diligent practice of thinking about their practices, and inquire about what else can be done to better their performance as teachers (Larrivee, 2000; Vijaya Kumari, 2014). Engaging in reflection also allows teachers to dismiss the culture of control and instead adopts a culture of inquiry, where problems are viewed as natural events that can be used as opportunities for further improvement (Larrivee, 2006). As teachers are provided with opportunities for dialogue and feedback during reflective practices (Darling-Hammond & Richardson, 2009), teachers are prompted to challenge their conclusions, generate new understandings and knowledge, and approach new issues (Ng & Tan, 2009; Shabeeb & Akkary, 2014), thus influencing their practices. The codes for the qualitative data were derived from literature. Schon (1983) has referred to reflection in action that allows for inspecting and thinking about the practices as they are occurring, and reflection on action, which is referred to as thinking back at one's practices, examining, and evaluating it to further understanding. Further, some scholars have used professional development programs with communities of practice to allow teachers to engage in critical reflective learning (Ng & Tan, 2009), and other researchers have provided teachers with structured opportunities for dialogue and feedback to engage in reflective practices with a coach with opportunities

(Darling-Hammond & Richardson, 2009). This allows teachers to examine their beliefs and practices in a more objective manner while allowing for perspective sharing on practices that are contextual (Harrison et al., 2005; Poom-Valickis & Mathews, 2013). Also, modeling provides teachers with the opportunity to notice, think about, and reflect on teacher practices in the classroom (Coffey, 2014; Wang & Hartley, 2003). Wang and Hartley (2003) highlight that models can be used to reflect closely on issues of teaching and learning in action. Hence the codes for the qualitative analysis included are *reflection in action, reflection on action, reflection using dialogue and feedback, reflection within communities of practice,* and *reflection using modeling*. All these coded were grouped together under the theme of "reflection" (see Appendix M).

Workshop Journal. The code *reflection on action* was exemplified by only one teacher who highlighted the impact of the workshop on her reflective practices as she stated, "It is making me think about the format of my class and how will I schedule this" (S. Nataraj, personal communication, March 6, 2018). The code *reflection on action* signifies that the teacher engaged in reflection after the workshop session (Schon, 1983).

PLC Meeting. The recordings from the bi-weekly PLC meetings demonstrated that three teachers discussed how the PLC format helped their reflection as evident by their comments. The codes *reflection on action* and *reflection using dialogue and feedback* were expressed by one teacher's comment, "I like using the three stages of reflection described here as you go deep within and that stillness will bring clarity that you (are) going in the right direction" (R. Walia, personal communication, March 8, 2018). The code *reflection on action* was further indicated by two other teachers who stated, "When I am instructing, it's hard to think deeply about that instruction. But reflection helps me narrow down the issue and focus on it" (J. Reddy, personal communication, March 8, 2018), and "[I]n basketball the games are

recorded. They go back and look at it and analyze it. So, as described here, in education too emulating that helps me a lot (I. Chugh, personal communication, March 8, 2018).

The code reflection on action indicated that the PLC meetings helped teachers to reflect after their class to review, analyze, and assess different aspects of their instructional practices (Schon, 1983). One teacher implied that reflecting post class was easier than during class as it allowed her to address the significant features of instructional practices. Additionally, the code reflection using dialogue and feedback was also determined from the data. The sharings and discussions at the PLC meeting provided teachers with different reflective practices and techniques that assisted their practice.

Coaching Meeting. During the coaching sessions five teachers discussed the impact of the sessions on their reflections as verified by their responses. One teacher's comments denoted the codes *reflection using dialogue and feedback* and *reflection on action* during two different sessions. She said,

> For me, personally I am observing but I am not making sense of the observation. Now I have this opportunity to come and reflect with you and you help me point in the right direction so that I can think about these aspects for myself. Then I can really understand what I am observing and why I need to observe it (J. Reddy, personal communication, March 5, 2018).

Additonally, J. Reddy also stated, "The reflection template you gave me helped during class as I used it to write little pointers that I could refer to later (J. Reddy, personal communication, March 23, 2018). Likewise, another two teachers' responses were coded as *reflection on action*, "After class I put down my reflections which helped me plan for the next class" (T. Jha, personal communication, February 15, 2018), and "I am recording data for her in class and then later reflect back and try to find patterns in her behaviour" (I. Chugh, personal communication, March 27, 2018). Finally, the codes, *reflection on action*, and

reflection using dialogue and feedback were also revealed in E. Shah's assertion, "Based on our discussion, I reflected about the movement and found it is working due to the novelty that is yet present" (E. Shah, personal communication, January 30, 2018).

The findings indicate that the coaching sessions provided opportunities for teachers to reflect on their practice. In one example, the teacher indicated that she was able to reflect through observing her teaching. In doing so, she was better able to understand what to observe and the importance of observation for improving her practice. In addition, the tools provided during the coaching session supported teachers' reflection on their practice and allowed for instructional preparation. Reflection through dialogue and feedback during the coaching session was also utilized within the coaching session. This allowed the teachers to discuss and determine the details of their reflective practice with their coach. Specifically, it provided teachers with direction and clarity regarding the focus of their reflections.

Teacher Interviews. The findings revealed that teachers discussed the role of the intervention on their reflective practices during the follow-up interviews. Five out of the seven teachers shared that the workshops contributed to their reflections, as evidenced by their comments. The code *reflection on action* was illustrated by one teacher's statement, "Now, I also change plans based on reflection. I have also started questioning and trying to stretch myself and be more effective" (I. Chugh, personal communication, March 29, 2018). The codes *reflection on action* and *reflection using dialogue and feedback* were indicated by another teacher's response, "It helped to reflect more. When I get stuck up (stuck) sometimes, I can read the PPT on comprehension and reflect on what is the fact and what I know" (M. Rehman, personal communication, April 2, 2018). Finally, the codes *reflection in action* and *reflection on action* were also demonstrated in R. Walia's comment, "For me, one big take away has been the pre, during and post teaching reflections and I have been doing that

earnestly especially since the last few weeks" (R. Walia, personal communication, April 5, 2018).

The results reveal that the intervention supported the increase of teachers' reflective practices, both during and post classroom instuctions (Schon, 1983). For instance, one teacher highlighted how reflection assisted her with critically reviewing and revising her lesson plans. Moreover, the accessibility to intervention materials provided teachers with the opportunity to enhance their reflective practices when needed.

During their interviews the teachers also shared regarding the effect of different components of the PLC on their reflective practices. An additional code *reflection within communities of practice* was revealed in several teachers' sharings. For instance, I. Chugh's stated, "It made me reflect on how I was breaking things down for students" (I. Chugh, personal communication, March 29, 2018). In addition, other teachers said, "Often we share something we are struggling with and others share how they would tackle it. It helps me reflect more about it" (T. Jha, personal communication, April 4, 2018), and "It has definitely impacted my reflective practices more than the workshops because it is ongoing" (E.Shah, personal communication, April 2, 2018). Similarly, most of the teachers also talked about the positive effect of coaching on their reflections during the teacher interviews. The codes *reflection on action* and *reflection using dialogue and feedback* were revealed by two teachers who mentioned, "It's always good to have a conversation about your practices with others in the meeting as it makes you reflect more (I. Chugh, personal communication, March 29, 2018), and "[W]ith reflection, it is happening even more because I have to come and tell you what's happening in the class. I have to think about it and then we brainstorm why" (E. Shah, personal communication, April 2, 2018). Another teacher's comments were coded for *reflection on action*, *reflection using dialogue and feedback* and *reflection using modeling*, "You doing a demo lesson and then reflecting on it aids my reflections too. Also, you shared

that I would have to add a reflection column which helped me make my next day's class better" (T. Jha, personal communication, April 4, 2018). Furthermore, the codes *reflection within communities of practice* and *reflection using dialogue and feedback* were demonstrated in S. Nataraj's response, "Because now I teach alone, just having another person to bounce of ideas was important, and I think it is necessary to help me reflect. The collaboration was meaningful. I definitely think having another perspective was very helpful" (S. Nataraj, personal communication, April 4, 2018).

The findings showed that teachers were using their discussions with the coach and their peers to participate in increased reflective activities (Darling-Hammond & Richardson, 2009). For example, one teacher spoke about how the sharings during the meetings required her to examine and evaluate her practices, and hence reflect more. Other teachers considered the association with peers during the intervention beneficial to their reflective practices as it allowed them to consider different viewpoints. Reflection using modeling was also used during the teacher interviews. The teachers increasingly reflected on their instructional practices after observing the coach model lessons or use certain strategies (Wang & Hartley, 2003).

Awareness of Beliefs and Discrepancies Between Beliefs and Practices

Teachers' awareness of beliefs and discrepancies between beliefs and practices were examined in teachers' responses in their workshop journal entries, PLC meetings, and coaching in addition to teacher interview data. Beliefs are referred to as propositions related to teaching, learning, learners, and subject matters that are accepted as true by the individual, which usually guide thinking and action (Borg, 2011; Tondeur et al., 2009). Teacher's instructional practices include techniques, procedures, activities, and approaches used by teachers in order to meet the identified learning objectives in the classroom (Akdeniz, 2016).

Theriot & Tice (2009) highlight that teachers' articulating and espousing certain beliefs about teaching does not warranty the transference of these beliefs into instructional practices, due to the teachers' lack of knowledge in dealing with unanticipated hindrances and barriers. Since teachers in India are more likely subjected to traditional approaches to learning and teaching (Batra, 2005), and they have received limited opportunities to challenge their beliefs, teachers are ambiguous regarding their beliefs and tend to adopt cultural aspects embedded into Indian educational institutes (Nargund-Joshi et al., 2011). Additionally, India continues to adopt a centralized policy-making practice that allows the teacher training curriculum to be developed by individuals removed from specific contexts of teaching, resulting in lack of consideration of contextual influences (Dyer et al., 2004). Hence, teachers have difficulty merging their beliefs and their practices, even when based on newly acquired notions of learning and teaching.

The codes *recognition of discrepancy based on acquired knowledge, inconsistent pedagogical beliefs and instruction, limited beliefs and practices, inconsistent lesson planning beliefs and practices, uncertainty between beliefs and practices,* and *difficulty aligning beliefs and practices* were used with the data from the different professional development sessions and teacher's interview data and grouped under the theme "awareness of beliefs and discrepancies between beliefs and practices" (see Appendix M).

Workshop Journal. The workshop journal entries revealed that all the teachers highlighted how the workshop led them to identify their beliefs or the discrepancy between their beliefs and practices in the classroom. The codes *recognition of discrepancy based on acquired knowledge* and *inconsistent pedagogical beliefs and instruction* were represented in one teacher's discussion on the importance of teacher modeling as an essential step in student learning and her observed discrepancy between what she taught was ideal and what she was actually doing within the class. This was illustrated in her comment, "I realize now that I do

model but don't use the same thinking stems and hence the children are not picking it up. In my head I thought I was doing it right" (I. Chugh, personal communication, January 16, 2018). Similarly, the code *inconsistent pedagogical beliefs and instruction* was demonstrated in other teachers' discussions. One teacher talked about how she regarded determining the big idea as the ultimate goal of comprehension instruction but highlighted the inconsistency in her practices. She stated, "While targeting comprehension in my classes, I used different tools and resources but there was no logical flow or build up to bigger things (E.Shah, personal communication, January 16, 2018). While another teacher emphasized how problem-based instruction models rather than rote learning in classes was essential. Yet, she realized she was not displaying the same in her classes as evident by her comment, "I was teaching my students the way I was taught in school, through repetition and teacher dominance" (R. Walia, personal communication, January 16, 2018).

The results signify that the workshops provided teachers with opporuntities to determine and challenge their existing beliefs, and as a result become aware of the discordance between their beliefs and practices. Specifically, a teacher recognized the importance of consistency in her instructional practices. Inconsistent pedagogical beliefs and instruction signified that teachers' beliefs about teaching did not necessarily transfer into classroom practices. One teacher stated how she tended to get caught up in details and dismiss the broader view in her practices. Also, another teacher acknowledged that her instructional goals did not reflect her beliefs about student learning.

PLC Meeting. Teacher's awareness of other beliefs and discrepancies between beliefs and practices were also examined during the PLC sessions. The code *limited beliefs and practices* was indicated in one teacher's statement, "There is awareness that there are limitations to my thinking" (R. Walia, personal communication, February 8, 2018). The code *inconsistent lesson planning beliefs and practices* was exemplified in T. Jha's response

regarding the importance for teachers to keep their objectives at the forefront while lesson planning. However, she also understood how that fails to be reflected in her classroom practices. She stated, “In trying to achieve my (daily) goals, I sometimes forget to zoom out and address other concepts that will eventually help with the bigger goal” (T. Jha, personal communication, March 22, 2018).

The findings suggest that the PLC meetings facilitated teachers to recognize that their beliefs regarding teaching and learning were restricted. This lack of proficiency or understanding of their beliefs led to a discrepancy between teacher’s beliefs and classroom practices (Theriot & Tice, 2009).

Coaching Meeting. The coaching sessions also revealed that teachers were becoming aware of their beliefs and discrepancies between their beliefs and practices. The code *uncertainty between beliefs and practices* was revealed in a teacher comment, “On one hand we are empowering the child to be independent and live on his own and yet be inclusive simultaneously and collaborate with others. It is sometimes a challenge to know how much to let go and how much to hold on to. It is a confusing mix and a delicate balance” (R. Walia, personal communication, January 17, 2018). The code *difficulty aligning beliefs and practices* was demonstrated by two other teachers who stated, “You help me see that collaboration is important but paired discussions has not worked as expecting them to have a conversation does not work. Group work is not really happening” (E.Shah, personal communication, January 18, 2018), and “I understand it’s important for him to engage with others but I don’t push him. I feel like if I do, he won't show up for class and will make excuses and go to the break out space” (I. Chugh, personal communication, January 31, 2018), while she discussed the need for peer-to-peer interaction. Likewise, the code *inconsistent pedagogical beliefs and instruction* was illustrated in another teacher’s response, “I get it now! Constantly asking questions creates too much anxiety. I have to show them that

it is ok not to know. Yet, I continue to go back and do the same thing" (J. Reddy, personal communication, January 15, 2018). Lastly, the codes *difficulty aligning beliefs and practices* and *inconsistent pedagogical beliefs and instruction* were displayed as one teacher spoke about the inconsistency between her thoughts about class structure and teacher preparation and her inability to ensure the same. She indicated, "I know we have discussed the important of class structure. But there was a lot of noise because everyone was distracted. There was a lot of chaos. I was not able to give attention to all students because I was not ready" (M. Rehman, personal communication, February 22, 2018).

The meetings with the coach allowed the teachers to acknowledge that they were unsure regarding their beliefs about learning and teaching. Some teachers were ambivalent regarding the degree of teacher control and student choice in the class. Further, teachers also realized that they faced difficulty in aligning their beliefs and practices, as they were uncertain about dealing with unanticipated hindrances and barriers in the classroom. For instance, one teacher discussed her struggle with implementing group work. Other teachers spoke about their issues with behaviour management within classes.

Teacher Interviews. The same theme was reiterated during the teacher interviews as well. With regard to the impact of workshops on teacher's increased awareness, the code *inconsistent pedagogical beliefs and instruction* was indicated in one teacher's response, "In terms of discrepancy between beliefs and what happens in the classroom, I have only seen it from a student's perspective. But this introduced me to the teacher's perspective" (E.Shah, personal communication, April 2, 2018). The codes *inconsistent pedagogical beliefs and instruction* and *difficulty aligning beliefs and practices* were demonstrated in a teacher's discussion on the significance of scaffolding in instruction during the workshops, and her mismatched practices, "Honestly, what it made me see is that as a teacher we need to go into such minute details, how we break down each task into the smallest component depending on

the needs of the child. Yet, sometimes I forget to break it down" (J. Reddy, personal communication, April 4, 2018). Moreover, the codes *inconsistent lesson planning beliefs and practices* and *difficulty aligning beliefs and practices* were exemplified in another teacher's explanation about her ideas regarding the need for observation to support her own plans and instructions in class, as well as her discrepancies. She indicated "[B]ecause observation was such a big idea, I was open to learn by observing from my students. So I observed them but don't always use that to guide my teaching practices" (S. Nataraj, personal communication, April 4, 2018).

Other remarks from the teacher interviews demonstrated how two teachers regarded the PLCs as positively impacting their awareness of beliefs and discrepancies between their beliefs and practices. M. Rehman spoke about her ideas surrounding the drafting process, especially breaking it into bit-size pieces to make it successful for the students. Yet, in her classroom practices, she continued to provide it as a whole large unit. The code *inconsistent pedagogical beliefs and instruction* was displayed in her response, "[A]fter reading the article on drafting I realized that what I was doing was too difficult for the students" (M. Rehman, personal communication, April 2, 2018). Also, J. Reddy talked about her ideas regarding the importance of strategies like the gradual release of responsibility model and her inability to use it effectively. The code *limited beliefs and practices* was indicated in her comment, "Earlier I had only a birds' eye view and did not know how to translate it to classroom practices" (J. Reddy, personal communication, April 4, 2018). Similarly, few teachers discussed the influence of coaching on their awareness of their beliefs as well as the discrepancies between their beliefs and practices during the interviews. For instance, the code *limited beliefs and practices* was represented by one teacher who said, "I realized I used to be very limited in the way I thought about teaching" (T. Jha, personal communication, April 4, 2018). Additionally, the code *inconsistent lesson planning beliefs and practices* was indicated

by another teacher who talked about the impact of one or two objectives rather than multitude goals and her mismatch in practices. She responded, "I was setting too many goals simultaneously before" (R. Walia, personal communication, April 5, 2018).

The findings demonstrated that teachers' espoused beliefs were not reflected in their classroom practices due to their limited, ambiguous, and narrow beliefs and practices, and challenges faced with aligning their beliefs and practices in the classroom. The teachers spoke about how the workshops and PLC meetings helped them to realize the need for teacher's instructions to match the students' level of readiness. Also, teachers discussed that the intervention was providing them with alternate perspectives, which helped them to acknowledge their own shortcomings in planning and instruction. Lastly, another teacher highlighted that the intervention supported her observation skills. However, she was not using the observation data to frame or modify her practices.

Perceptions of Knowledge and Skill In Constructivist Teaching and Learning

Lastly, the impact of PD on teacher's knowledge and skill in constructivist teaching and learning was determined during the different sessions and teacher interviews. Constructivism regards learning as an active process of construction rather than mere acquisition of knowledge (Cunningham & Duffy, 1996; Von Glasersfeld, 2012). Hence constructivist teaching is not viewed as transference from teacher to learner, but as a process of supporting the construction through an active involvement and interaction with the environment (Cunningham & Duffy, 1996). Consequently, constructivist teaching and learning with regard to literacy would deem reading as a transactional process between a reader and a text within a social context, rather than reading as a skill that is limited to decoding (Richardson, Anders, Tidwell, & Lloyd, 1991). Further, constructivist practices for comprehension instruction would enlist the reader as an active participant who interprets the text based on his or her own background knowledge and perceptions (Richardson et al.,

1991). Other constructivist practices in teaching include allowing the student to interact with the environment, with peers in the classroom, and the teacher so as to ask questions, determine resources, and offer viable solutions or answers (Draper, 2012). Additionally, constructivist teachers can support student learning through "modeling, contingency, managing feedback, instructing, questioning, and cognitive structuring" (Gallimore & Tharp, 1990, p.177).

The data from teacher's responses and interviews were coded for *knowledge about constructivist literacy teaching, knowledge about learner's role,* and *knowledge about constructivist pedagogical practices*. These codes were grouped together under the theme "Perceptions of Knowledge and Skill In Constructivist Teaching and Learning" (see Appendix M).

Workshop Journal. The teachers indicated the positive impact of the workshops on their knowledge and skills in constructivist teaching and learning. I. Chugh highlighted that the workshops equipped her to learn the strategies required to enlist student's active participation in the classroom. The code *knowledge about learner's role* was demonstrated by her statement, "Teaching (comprehension) strategies explicitly to children allows them to stay engaged in the process by being active participants rather than just reading the words on the page" (I. Chugh, personal communication, January 16, 2018). Additionally, the code *knowledge about constructivist literacy teaching* were displayed by other teachers who indicated, "[It] showed me how determining importance and background knowledge activation is used to improve comprehension" (E.Shah, personal communication, March 6, 2018), and "It demonstrated how we need to pay attention to what and also how we read so we are able to capture the true essence of reading" (R. Walia, personal communication, January 16 2018). Also, one teacher described how the workshops helped her to appreciate the different stages of modeling, guidance, and independence, as well as skills needed in

equipping the students to comprehend. The code *knowledge about constructivist literacy teaching* was also attributed to her response, "I learned so much about the gradual release of responsibility model and the different strategies used like monitoring comprehension" (J. Reddy, personal communication, February 6, 2018).

The workshops impacted teachers' notions about literacy teaching and learning. Specifically, it allowed teachers to regard reading as a transactional process between a reader and a text within a social context, rather than reading as a skill that is limited to decoding (Richardson, Anders, Tidwell, & Lloyd, 1991). Also, one teacher highlighted that the workshops led her to understand the significance of how something was read. Another teacher discussed the importance of scaffolded reading instructional practices with the use of appropriate strategies. Furthermore, the code knowledge about learner's role was used. This demonstrated that the workshops allowed teachers to become aware of the active role of the participants in the learning process from a constructivist perspective (Cunningham & Duffy, 1996).

PLC Meeting. The teacher responses during the PLC meetings indicated the influence of different components of the PLC on teacher's knowledge and skill about constructivist teaching and learning. The code *knowledge about constructivist pedagogical practices* was highlighted by three teachers, "I read how when you are together, you fuse your knowledge together. How collective knowledge leads to a rich generation of ideas. (Hence) the teacher would use critique and feedback from peers" (S. Nataraj, personal communication, February 8, 2018), "[W]hen a student is doing their own work, their awareness at that time is limited. When they get feedback from others, they get perspective from others" (J. Reddy, personal communication, February 8, 2018), and "Teaching students how to give feedback (by) commenting on steps they used, difficulties they faced can help

themselves and their peers in understanding the possible pitfalls and advantages (M. Rehman, personal communication, March 8, 2018).

The results revealed that the PLC meetings informed teachers regarding constructivist pedagogical practices. The teachers examined practices related to group work, collaboration, and cooperation in learning. Hence, the PLCs provided teachers with methods to support student's interactions with the environment, and peers in the classroom (Cunningham & Duffy, 1996; Von Glasersfeld, 2012).

Coaching Meeting. The coaching meetings also influenced the teacher's knowledge and skill about constructivist teaching and learning. Many teachers indicated the code *knowledge about constructivist pedagogical practices* through their responses. For instance, a teacher who tried one of the recommendations by the coach, observed, "I like your suggestion. When the children are paired I find that they are better engaged and are able to contribute ideas. The ownership increases in pairs" (S. Nataraj, personal communication, January 18, 2018). Also, while talking about student engagement and the teacher's role in the class, T. Jha expressed, "Now, I'm starting to understand that responding to the students' curiosity and being flexible with content helps (the) student stay focused" (T. Jha, personal communication, February 27, 2018). Lastly, another teacher's discussed how keeping the child's needs in the forefront while lesson planning and instruction supports student learning in the class. She mentioned,

> I saw (a) huge difference for some kids with the movement breaks, for others it worked as a reinforcement, and for some it did not. I'm also slowly realizing that it may be because the activities may have not been appropriate for this particular child. Earlier I was just trying to finish my agenda. But you are showing me that when the teacher is more excited and energetic, it gets the kids to perk up as well. I think these breaks are getting me to be excited which is great for kids too. The students think she is so excited

> to be doing this and hence they too want to try it and (this) leads to increased motivation (E.Shah, personal communication, January 23, 2018).

The coaching meetings allowed the teachers to learn and implement different instructional practices. For example, one teacher spoke about how coaching acquainted her with practices that supported the construction of knowledge through the participants' active involvement and interaction with the environment (Cunningham & Duffy, 1996). Further, another teacher highlighted that implementing certain practices in her planning, instructions, student responsivess, and learning led to increased value.

Teacher Interviews. During the interviews, the teachers expressed their thoughts regarding the positive impact of the workshops on their knowledge and skill about constructivist teaching and learning. The codes *knowledge about learner's role* and *knowledge about constructivist pedagogical practices* were indicated in I. Chugh's description, "(The) knowledge of theory about the teacher's and student's role and the practice with guiding rather than telling delivered at the session has helped me become very deliberate when I am planning and then when I execute and make decisions" (I. Chugh, personal communication, March 29, 2018). The code *knowledge about constructivist pedagogical practices* were also revealed in M. Rehman's and J. Reddy's thoughts, "The workshops gave me a lot of information and methods that I can use in the classroom to conduct my classes. The gradual release of responsibility helped me a lot because the modeling (will) help the children" (M. Rehman, personal communication, April 2, 2018), and "Honestly, what it made me see is that as a teacher we need to go into such minute details, how we break down each task into the smallest component depending on the needs of the child. That was almost like a revelation" (J. Reddy, personal communication, April 4, 2018). The teachers also cited about the favorable role of the PLCs on their knowledge and skill about constructivist teaching and learning. The code *knowledge about constructivist literacy*

teaching was exemplified by one teacher, "[W]hile reading the articles, they play a very critical role. Like I applied the read aloud strategy and started scripting my lesson and now I can confidently do a read aloud. I understand the need for using think-alouds and guiding student's thinking" (T. Jha, personal communication, April 4, 2018). Similarly, the coaching sessions led to an increase in teachers' knowledge and skill about constructivist teaching and learning as evident by the teacher's responses in the interview. The code *knowledge about constructivist pedagogical practice* was reflected in two teachers' responses, "In terms of (practices that are) age appropriate and at the same time challenging for the child. I have learnt a lot from these sessions with you. I am now looking at teaching even more and then reaching out in a way that the child is ready to receive" (R. Walia, personal communication, April 5, 2018), and

> It (coaching) of course enhanced (my knowledge and skill) because we discussed different strategies in the classroom and how I can access him (the student). That shared understanding helped. Like adopting a more systematic approach so to provide the student with success opportunities (S. Nataraj, personal communication, April 4, 2018).

The data from the teacher's interviews indicated that the teachers found the intervention acquainted them with principles of constructivist teaching and learning in terms of general classroom strategies, specific literacy based practices, and the active role of the participants (Cunningham & Duffy, 1996). Specifically, the teachers addressed practices related to scaffolding in learning, reading strategies, and systematic planning.

Research Question 3: How did teachers' exposure to the professional development and the short-term outcomes (i.e. increase in teachers' 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, and 3) perceptions of knowledge and skills in constructivist practices) change their beliefs about teaching,

their efficacy, instructional practices in the classroom, and the alignment between their beliefs and practices?

Teacher's Beliefs

Fives & Buehl (2008) refer to teacher beliefs as beliefs "preservice and practicing teachers have about topics and / or constructs related to teaching, learning, and education" (p.135). According to Borg (2011) beliefs are "propositions individuals consider to be true and which are often tacit, have a strong evaluative and affective component, provide a basis for action, and are resistant to change" (p. 370). Thus, teachers' beliefs include the notions about learning and teaching that they embrace as the truth. Teachers' beliefs are formed as a result of their personal and professional experiences (Riojas-Cortez et al., 2013; Tillema, 2000). Scholars have found the school environment to be more potent than pre-service teacher training in defining teachers' beliefs (Massengill et al., 2005).

A constructivist perspective regards learning as a process of knowledge construction, rather than knowledge transmission, and it involves action, as the learner creates new meaning and understanding based on his or her interactions with the environment through a reflective process (Aldrich & Thomas, 2005; Applefield et al., 2000; Dagar & Yadav, 2016). In addition to placing the learner at the center of the process, collaboration among learners is emphasized in this framework (Tam, 2000; Vijaya Kumari, 2014). So, learners share their individual conceived frameworks with peers during the learning process, resulting in knowledge being continuously refined. In essence, constructivism conceives of learning as an active, learner focused, collaborative process that results from the complex interaction between the learner's prior knowledge, the learning context, and the content at hand (Dagar & Yadav, 2016; Tam, 2000; Vijaya Kumari, 2014).

The data from the Teacher Belief Survey (Woolley et al., 2004) for each teacher was used to examine the change in teachers' beliefs over time. Also, in order to examine the

qualitative data from the teacher's responses and interviews, the following codes were used, *beliefs about learning, beliefs about teaching, beliefs about the role of a teacher, beliefs about the role of a learner, beliefs due to professional experiences,* and *beliefs due to personal experiences*. All these codes were placed under the theme 'teacher beliefs" (see Appendix M).

Teacher Belief Survey. The post-intervention average scores of teachers for Traditional and Constructivist Teaching Items on the Teacher Belief Survey (TBS) instrument, the difference in the scores, and the approach are presented in Table 5.3. This data shows that the highest average traditional score is 3.82 (SD=1.56), and the lowest average traditional score is 2.27 (SD=1.62). On the other hand, the highest average constructivist score is 5.10 (SD=1.20) and the lowest average constructivist score is 4.30 (SD=1.42). Further, it can be seen that the difference in the average scores of teachers for traditional and constructivist teaching were all positive scores. The range of difference in average scores between traditional and constructivist teaching was from 0.98 to 2.83. Further, the data reveals a noteworthy finding that 100% teachers in this study had a more constructivist rather than a traditional approach.

The difference in the average scores of teachers for Traditional and Constructivist Teaching Items on the Teacher Belief Survey (TBS) instrument, and the approach from the needs assessment and post-intervention survey are presented in Table 5.4. The data demonstrates the range of difference in average scores between traditional and constructivist scores during the needs assessment are from -3.36 to 1.55. Further, only one difference in average score between traditional and constructivist beliefs were positive, whereas the other six difference in average scores between traditional and constructivist beliefs were negative in the needs assessment data. Additionally, in the needs assessment, only 0.14% teachers adopted a constructivist approach, whereas 0.86% teachers had traditional beliefs. Post-

intervention data shows that all the difference in average scores between traditional and constructivist scores were positive, and the range lies between 0.98 and 2.83. Also, 100% teachers adopted constructivist beliefs in post-intervention. Hence the data highlights that in the needs assessment, only 0.14% teachers adopted a constructivist approach, but in the post intervention 100% teachers espoused constructivist beliefs.

Based on these findings, it can be concluded that exposure to the PD and the short-term outcomes (i.e. increase in teachers' 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, and 3) knowledge and skills in constructivist practices) had a positive impact on teacher's beliefs, as six out of the seven teachers changed from a traditional approach during the needs assessment to a constructivist approach during post-intervention.

Table 5.3:

Post-intervention average scores of teachers for Traditional and Constructivist Teaching Items, Difference in Scores on the Teacher Belief Survey (TBS), and the resulting approach.

	I. Chugh	E. Shah	S. Nataraj	T. Jha	M. Rehman	R. Walia	J. Reddy
Average Traditional Teaching (TT) Score	2.64	2.91	2.27	2.73	3.73	3.09	3.82
TT Standard Deviation	1.74	1.22	1.62	1.56	1.22	1.40	1.56
Average Constructivist Teaching (CT) Score	4.80	4.60	5.10	4.30	4.90	4.30	4.80
CT Standard Deviation	1.81	0.84	1.20	1.49	0.88	1.42	0.63
Difference in average scores (CT – TT)	2.16	1.69	2.83	1.57	1.17	1.21	0.98
Approach	CT	CT	CT	CT	CT	CT	CT

Table 5.4:

Difference in the average scores of teachers for Traditional and Constructivist Teaching Items on the Teacher Belief Survey (TBS) instrument, and the approach from the needs assessment and post-intervention survey.

Teachers	Needs Assessment difference in average scores (CT – TT)	Needs Assessment Approach	Post -Intervention difference in average scores (CT – TT)	Post – Intervention Approach

I. Chugh	1.55	CT	2.16	CT
E. Shah	-1.18	TT	1.69	CT
S. Nataraj	-1.64	TT	2.83	CT
T. Jha	-3.36	TT	1.57	CT
M. Rehman	-1.71	TT	1.17	CT
R. Walia	-1.47	TT	1.21	CT
J. Reddy	-0.75	TT	0.98	CT

Workshop Journal. During the workshop journal exercise, some teachers highlighted the impact of the workshops on their beliefs. For instance, when asked about the big take-away from the workshops, the code *beliefs about the role of a teacher* and *beliefs about teaching* were exemplified by M. Rehman's statement, "I need to understand it (comprehension strategies) fully before using it in classes. I realize that I have to be open to learning myself (M. Rehman, personal communication, February 6, 2018). Also, another code *beliefs about teaching* was demonstrated in another teacher's comment, "Teaching the students to become active, independent readers must be fostered in our classes" (J. Reddy, personal communication, March 6, 2018). Lastly, the codes *beliefs about learning, beliefs about teaching,* and *beliefs about the role of a teacher* were seen in T. Jha's response, "Actually, each learner has their own style and teachers must understand that before teaching" (T. Jha, personal communication, March 6, 2018).

The findings suggest that the workshops led teachers to address their beliefs related to constructs regarding teaching, learning, and education (Fives & Buehl, 2008). One teacher discussed her beliefs related to her role as a teacher. She examined how her willingness to learn would impact student learning. Another teacher highlighted beliefs about the learner and the learning process.

PLC Meeting. During a discussion on the articles read in the PLC meet, the codes *beliefs about the role of a learner* and *beliefs about learning* were indicated by one teacher who said, "It is important for the child to read. The more the child reads, the more the background knowledge. Then they can connect more and the more they are able to make

sense" (R. Walia, personal communication, January 24, 2018). Additionally, the codes *beliefs about the role of a teacher, beliefs about the role of a learner* were revealed in another teacher's comments, "(We must) get the kids to think deeply instead of accepting superficial answers. That is possible when he (the child) will be actively involved." (I. Chugh, personal communication, February 8, 2018). Also, with regards to the video reflections in the PLC meet, the codes *beliefs about the role of a teacher* and *beliefs about teaching* were indicated by E. Shah, "It is important (for teachers) to model, scaffold, and provide mini-lessons if breakdowns are identified" (E.Shah, personal communication, March 8, 2018). During another video presentation, the codes *beliefs about learning* and *beliefs about teaching* were expressed by J. Reddy, "(I believe) peers teaching and giving you feedback is useful and leads to independence" (J. Reddy, personal communication, March 22, 2018). Hence, it can be seen that teachers did adopt more constructivist beliefs during article and video discussions in the PLCs meets.

The PLC meetings allowed teachers to address their beliefs about the notions of learning and teaching. One teacher examined beliefs about the learner's participation during learning. Further, other teachers discussed the significance of different activities in learning, such as reading, and providing feedback.

Coaching Meeting. The coaching sessions did have an affect on the teacher's beliefs as revealed in some comments through the discussions. The code *beliefs about learning* was displayed in one meeting, as a teacher highlighted, "I am beginning to see that learning is all about collaboration" (R. Walia, personal communication, January 17, 2018). Furthermore, the codes *beliefs about the role of a teacher* and *beliefs about learning* were revealed by another teacher's statement,

> I have realized that (it's important to stay calm and centered) rather than getting annoyed all the time, because that just doesn't work. The minute the student gets any

> sort of reinforcement from you, the behaviour will increase. So it requires me to regulate myself and be really calm. Then maybe there is a chance of getting across. Also understanding that expecting the student to be all right at all times is unreasonable. It is easier to explain what others are doing and show him video clips of other students and also video clips of the times when he is well behaved. Basically the student needs to feel accepted and acknowledged. I need to find the middle ground that I am giving you your space and allowing you and then there is the time when you need to come back and focus (J. Reddy, personal communication, January 15, 2018).

The teacher's beliefs about their role and the learning process were examined during the coaching meetings. The beliefs about learning included beliefs about teamwork, and behaviour management. Additionally, a teacher spoke about how her role as a teacher impacted student learning in the class.

Teacher Interviews.

Exposure to PD. During the interviews, the teachers shared how the workshops supported their beliefs about learning and teaching. The codes *beliefs about learning, beliefs about teaching, beliefs due to professional experiences* and *beliefs due to personal experiences* were indicated by one teacher, who highlighted the change in her beliefs in her comment, "(I) walked in to Gateway with a certain belief like I have to do 10 worksheets. Now, I am able to appreciate learning through different modalities" (T. Jha, personal communication, April 4, 2018). Similarly, another teacher shared regarding the influence of the workshops on her beliefs. The codes *beliefs about teaching* and *beliefs due to professional experiences* was reflected in her statement, "I think I've always had ideas (and) beliefs (about) teaching but they weren't based on anything except my experience as a student, but the PD made it more concrete. It was based on research" (E.Shah, personal communication, April 2, 2018). In addition, the effect of the PLCs on their beliefs was also

emphasized in the interviews. The codes *beliefs about learning* and *beliefs about teaching* were highlighted during one conversation, as a teacher said, "Learning is not so easy. It (teaching) is difficult to implement. There are going to be failures in the beginning and then you grow" (M. Rehman, personal communication, April 2, 2018). Also, E. Shah spoke about the greater influence of PLC than workshops on her beliefs. The code *beliefs due to professional experiences* was demonstrated in her response,

> (The PLCs contributed) a lot more than the workshops. It was more focused, intimate, (and) detailed. Because when I was in the workshop I felt it was all new so maybe I couldn't take that much. It (coaching) gave steps to my ideas and beliefs that were introduced in the workshops. It also gave reason to them. I always believed you should read for pleasure but the concrete information provided helped me justify why (E.Shah, personal communication, April 2, 2018).

Lastly, the teachers also attributed the coaching as instrumental with regard to effecting their beliefs. The codes *beliefs about teaching* and *beliefs due to professional experiences* were reflected in T. Jha's sharing, "I realized I used to be very limited in the way I thought about teaching. (t)he coach coming in for observations, our weekly meetings where we check the plan, and tagging you on daily plans, it is because of the coach('s) support that I could modify my thoughts about teaching" (T. Jha, personal communication, April 4, 2018). When asked if the coaching sessions contributed to their beliefs, the codes *beliefs about learning* and *beliefs due to professional experiences* were demonstrated in another teacher's statement, "Yes, absolutely! (The impact about) the (student's) mindsets was (were) a huge one. (t)hat everyone can be learning even though at a different pace" (S. Nataraj, personal communication, April 4, 2018).

The data from the teacher's interviews revealed that the intervention led the teachers to modify their beliefs related to teaching, learning, and education. For instance, one teacher

highlighted that the professional development expanded her view of learning beyond mere completion of worksheets. Also, another teacher discussed that the workshops were influential in amending her beliefs by providing research related to learning and teaching. Belief due to professional experiences was also employed during the teacher interviews. One teacher highlighted the positive role of the workshop on her beliefs. Another teacher stated that she found the PLCs to be most influential in shifting her beliefs. Lastly, a teacher identified the coaching meeting as most significant in examining and revising her beliefs.

Short-term outcomes. Furthermore, the teachers also discussed the influence of the short-term outcomes (i.e. increase in teachers' 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, and 3) knowledge and skills in constructivist practices) on their beliefs during the interviews. The codes *beliefs about the role of a teacher, beliefs about teaching,* and *beliefs due to professional experiences* were indicated by two teachers when asked about the influence of increased reflective opportunities on their beliefs. S. Nataraj responded, "Something that I have learnt along the way is that as (a) teacher I am continuously learning, not only about my students, but also how I am teaching them" (S. Nataraj, personal communication, April 4, 2018). Moreover, T. Jha stated, "It (the reflective opportunities) impacts the belief about a certain thing. For example if you (I) think you (I) can teach fiction and non fiction genre in a certain way, then I start thinking about it different after these (reflective) opportunities" (T. Jha, personal communication, April 4, 2018). With regard to the influence of teacher's increased awareness of beliefs and discrepancies between beliefs and practices on their beliefs about teaching and learning, the codes *beliefs about teaching, beliefs about learning,* and *beliefs due to professional experiences* were exemplified by two teachers, "It (increased awareness) made me realize that I can push the boundaries so much more with students" (J. Reddy, personal communication, April 4, 2018), and "I came in thinking that's (learning from a textbook is) how learning or teaching is.

However, this (professional development) showed me that learning is about skills and building on those required in the 21st century. It was more meaningful too" (S. Nataraj, personal communication, April 4, 2018).

Lastly, when teachers were asked to examine the impact of the increased knowledge and skill on their beliefs about teaching, the codes *beliefs about teaching, beliefs about learning,* and *beliefs due to professional experiences* were revealed in other teacher's responses, "For me it was a doorway to get into this world of teaching and it's just opened up for me. There are so many different avenues and I'm looking around and observing now" (R. Walia, personal communication, April 5, 2018), and

> I've also realized we need to make these students do stuff (like) project based learning for them to realize. The more concrete, it helps more. We can't do the same thing day in and day out, but we have to keep evolving. We went through school with teachers doing the same thing. We are living in a rapidly changing world, so we have to keep abreast with the latest, keeping our students in mind. Also we need to provide the safe space and structure for learning to happen. So (when we use) the same language throughout school and classrooms (and) following (the) same structure, (then) the processing of different language and structures (for different classes) is eliminated (J. Reddy, personal communication, April 4, 2018).

The findings indicated that the increase in reflections allowed the teachers to evaluate and amend their beliefs related to their role and their instructional practices. Moreover, the increased awareness of their beliefs and practices led teachers to dismiss certain beliefs and adopt new beliefs about student learning. Finally, the increased knowledge and skill influenced teachers to broaden their beliefs and be receptive to new notions of learning and teaching.

Teacher Efficacy

Teacher efficacy is defined as ‘‘beliefs in one’s capacity to organize and execute the courses of action required to produce given attainments’’ (Bandura, 1977; Hoy & Spero, 2005). Further it is defined as the teacher’s confidence in his/her ability to promote student learning (Bandura, 1977). Bandura suggested that behaviour is influenced by general outcome expectancy such that behaviour results in desirable outcomes, and self-efficacy such that an individual possesses the skill to create the outcome. In terms of teacher efficacy, outcome expectancy includes the extent to which students can be taught regardless of other aspects such as socioeconomic status, backgrounds, and school settings. The data for each teacher on the Teacher Efficacy Survey (Gibson & Dembo, 1984) was used to examine the changes in teacher efficacy.

Teacher Efficacy Scale. The composite total score, average and percentage change of all teachers on personal teaching efficacy, general teaching efficacy, and total efficacy scales for pre and post intervention are presented in Table 5.5. With regard to personal teaching efficacy, the scores range from 31 to 46 in the pre-intervention, and from 33 to 46 in post-intervention. The average scores for personal teaching efficacy in pre-intervention are 38.00 and in post-intervention are 41.71. It can also be seen that the percentage change from pre to post intervention on the personal teaching efficacy scale is 9.77. Overall, this demonstrates an increase in teachers’ personal teaching efficacy. On the other hand, the range of scores for teacher’s general teaching efficacy in pre-intervention are from 21 to 34, and in post-intervention are from 19 to 31. The general teaching efficacy average scores in pre-intervention are 27.86, and in post-intervention are 25.57. Hence, there is no improvement in teacher’s general teaching efficacy, as evident by the negative percentage change in scores (-8.21) from pre to post intervention. Additionally, the teacher’s total efficacy score range in pre-intervention lie between 52 and 79, and the range of scores in post-intervention are from 52 to 77. The average total efficacy score in pre-intervention was 65.86, which increased to

67.29 in post-intervention. So, it can be observed that teacher's total efficacy has shown an increase, indicated by the percentage change score (2.17) from pre to post intervention on the total efficacy scale. In conclusion, the percentage change score from pre to post intervention were positive for personal teaching efficacy and total efficacy, but negative for general teaching efficacy. Hence, it can be summed up that teachers demonstrated an increase in personal and total teaching efficacy, but not in general teaching efficacy.

The average changes from pre to post intervention on personal teaching efficacy; general teaching efficacy, and total efficacy across all participants is displayed in Table 5.6. The range of changes in personal teaching efficacy is from -2 to 8. For the personal teaching efficacy change, only one change score is negative, whereas the other six change scores are positive. The average change from pre to post intervention on personal teaching efficacy is 3.71, signifying a positive increase. In general teaching efficacy, the changes range from -7 to 1. Furthermore, five change scores are negative and only two are positive in general teaching efficacy. The average change on general teaching efficacy scale (-2.29) reveals a lack of improvement in teacher's scores. Lastly, five of the total efficacy changes are positive and two total efficacy changes are negative. The total efficacy changes range from -9 to 9. The teacher's overall efficacy shows an improvement, as revealed by the average change in scores from pre to post intervention (1.43). In sum, the analysis of the data illustrates that the average personal teaching efficacy change and average total efficacy change are positive, but the average general teaching efficacy change is negative. Hence, there is an increase in teacher's personal teaching efficacy and total efficacy. However, teacher's general teaching efficacy did not demonstrate a change in the positive direction.

An item analysis with the total number and percentage of teachers that demonstrated an increase, decrease, or stayed the same on each item of the personal and general teaching efficacy scale from pre to post intervention is portrayed in Table 5.7. It can be seen that

approximately 43% of participants showed an increase in scores for item 1 (“When a student does better than usual, many times it is because I exerted a little extra effort”), item 9 (“If a student masters a new concept quickly, this might be because I knew the necessary steps in teaching that concept”), item 11 (“If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson”), item 12 (“If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly”), and item 16 (“If one of my student’s couldn’t do a class assignment, I would be able to accurately assess whether the assignment was at the correct level of difficulty”) included within personal teaching efficacy. Further, it can also be concluded that 25% or more teachers increased on all items of personal teaching efficacy, except for item 8 (“When the grades of my students improve it is usually because I found more effective teaching approaches”). On the other hand, the highest percentage of teachers (42.86%) showed a decrease on item 4 (“When a student is having difficulty with an assignment, I am usually able to adjust to his or her level”) of personal teaching efficacy.

With regard to the item analysis from the general teaching efficacy, it is observed that no teacher increased on item 5 (“If students aren’t disciplined at home, they aren’t likely to accept any discipline”), and 40% or more teachers decreased on 5 out of the 7 items. More specifically, 40% or more teachers decreased on item 3 (“The amount that a student can learn is primarily related to family background”), item 5 (“If students aren’t disciplined at home, they aren’t likely to accept any discipline”), item 7 (“A teacher is very limited in what he/she can achieve because a student’s home environment is a large influence on her/his achievement”), item 10 (“If parents would do more with their children, I could do more”), and item 14 (“Even a teacher with good teaching abilities may not reach many students”).

Additionally, 25% or more teachers stayed the same on all items except item 8 (“When the grades of my students improve it is usually because I found more effective

teaching approaches") on personal teaching efficacy, and item 7 ("A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on her/his achievement") on general teaching efficacy. Furthermore, it can also be observed that 40% or more teachers stayed the same on item 1 ("When a student does better than usual, many times it is because I exerted a little extra effort"), item 9 ("If a student masters a new concept quickly, this might be because I knew the necessary steps in teaching that concept"), item 11 ("If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson"), item 12 ("If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly"), and item 16 ("If one of my student's couldn't do a class assignment, I would be able to accurately assess whether the assignment was at the correct level of difficulty") on personal teaching efficacy. On the other hand, 40% or more teachers stayed the same on item 2 ("The hours in my class have little influence on students compared to the influence of their home environment"), item 5 ("If students aren't disciplined at home, they aren't likely to accept any discipline"), and item 13 ("The influences of a student's home experiences can be overcome by good teaching") on general teaching efficacy. It can also be seen that the highest percentage of teachers (57.14%) stayed the same on item 2 ("The hours in my class have little influence on students compared to the influence of their home environment") on general teaching efficacy.

Table 5.5:

The total, average, and the percentage change in scores of all teachers on personal teaching efficacy, general teaching efficacy, and total efficacy scale for pre and post intervention.

	Personal Teaching Efficacy Scale		General Teaching Efficacy Scale		Total Efficacy Scale	
Teachers	Pre - Intervention	Post - Intervention	Pre - Intervention	Post - Intervention	Pre - Intervention	Post - Intervention
I. Chugh	40	41	27	22	67	63
E. Shah	31	39	28	29	59	68
S. Nataraj	39	46	34	31	73	77
T. Jha	36	44	23	22	59	66
M. Rehman	46	44	33	26	79	70

R. Walia	31	33	21	19	52	52
J. Reddy	43	45	29	30	72	75
Total	266	292	195	179	461	471
Average	38.00	41.71	27.86	25.57	65.86	67.29
Percentage Change		9.77		-8.21		2.17

Table 5.6:

The average changes from pre to post intervention on personal teaching efficacy, general teaching efficacy, and total efficacy across all participants.

Teachers	Personal Teaching Efficacy Change	General Teaching Efficacy Change	Total Efficacy Change
I. Chugh	1	-5	4
E. Shah	8	1	9
S. Nataraj	7	-3	4
T. Jha	8	-1	7
M. Rehman	-2	-7	-9
R. Walia	2	-2	0
J. Reddy	2	1	3
Total	26	-16	10
Average	3.71	-2.29	1.43

Table 5.7:

The total and percentage of teachers that demonstrated an increase, decrease, or no change on each item of the personal and general teaching efficacy scale from pre to post intervention.

PTE*	Total Increase	Total Decrease	Total Same	% Increase	% Decrease	% Same
When a student does better than usual, many times it is because I exerted a little extra effort.	3	1	3	42.86	14.29	42.86
When a student is having difficulty with an assignment, I am usually able to adjust to his her level.	2	3	2	28.57	42.86	28.57
When I really try, I can get through to most difficult students.	2	2	2	28.57	28.57	28.57
When the grades of my students improve it is usually because I found more effective teaching approaches.	1	1	1	14.29	14.29	14.29
If a student masters a new concept quickly, this might be because I knew the necessary steps in teaching that concept.	3	2	3	42.86	28.57	42.86
If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson.	3	1	3	42.86	14.29	42.86
If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly.	3	2	3	42.86	28.57	42.86
When a student gets a better grade than he usually gets, it is usually because I found better ways of teaching that student.	2	1	2	28.57	14.29	28.57
If one of my student's couldn't do a class assignment, I would be able to accurately assess whether the assignment was at the correct level of difficulty.	3	1	3	42.86	14.29	42.86

GTE**						
The hours in my class have little influence on students compared to the influence of their home environment.	1	2	4	14.29	28.57	57.14
The amount that a student can learn is primarily related to family background.	2	3	2	28.57	42.86	28.57
If students aren't disciplined at home, they aren't likely to accept any discipline.	0	4	3	0.00	57.14	42.86
A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on her/his achievement.	2	4	1	28.57	57.14	14.29
If parents would do more with their children, I could do more.	2	3	2	28.57	42.86	28.57
The influences of a student's home experiences can be overcome by good teaching.	3	1	3	42.86	14.29	42.86
Even a teacher with good teaching abilities may not reach many students.	1	4	2	14.29	57.14	28.57

Note. *PTE – Personal Teaching Efficacy **GTE – General Teaching Efficacy

Teachers' Classroom Practices

Teacher's classroom practices are described within the framework for teaching grounded in a constructivist view of learning and teaching, namely, The Framework for Teaching (Danielson, 2013). This framework was introduced in 1996, and "identifies those aspects of a teacher's responsibilities that have been documented through empirical studies and theoretical research as promoting improved student learning" (Danielson, 1996, p. 1). For this study, teacher's classroom practices will be measured using only the first three domains, of the framework namely, planning and preparation; classroom environment; and instruction to incorporate the variety of components related to teaching. The framework highlights different components of teacher's instructional practices in the classroom, such as "content instructional strategies", "pedagogical instructional strategies", "managing classroom procedures", "classroom environment", and "planning and preparation".

Additionally, researchers (Neuman & Cunningham, 2009) have found coaching along with the seminar model of professional development to be most effective in impacting practices for teachers in classrooms. Literature also highlights how the intention of analyzing one's practices during reflection provokes the formation of new beliefs and accompanying practices (Dewey, 1933), in a constructive and critical manner (Poom-Valickis & Mathews,

2013). Lastly, there is a tremendous amount of research that shows how teachers' beliefs influence their teaching practices (Doruk, 2014; Kukari, 2004; Moore, 2008; Stuart & Thrulow, 2000; Yilmaz & Sahin, 2011) and play a significant role in teacher decision making (Stuart & Thurlow, 2000; Tillema, 2000), and teachers' understanding and ability to engage in effective interactions with students (Hamre et al., 2012).

Teachers' scores on the Framework for Teaching (Danielson, 1996) were used to determine the changes in teachers' instructional practices in the classroom. In addition, the following codes, *content instructional strategies, pedagogical instructional strategies, managing classroom procedures, classroom environment, planning and preparation, impact of coaching on instructional practices, impact of reflection on instructional practices* and *impact of teacher's beliefs on instructional practices* emerged from teachers' qualitative data from the session and interviews. These codes were placed under the theme "instructional practices in the classroom" (see Appendix M).

Danielson Framework for Teaching. The percentage of scores from the needs assessment and pre-intervention on the different categories (unsatisfactory, basic, proficient, and distinguished) of Danielson's Framework of Teaching across all participants are presented in Table 5.8. The percentage of scores for the category 'Unsatisfactory' reduced from 36.61 in the needs assessment to 33.93 during the pre-intervention. However, the percentage of scores on the category 'Basic' increased from the needs assessment (42.86) to pre-intervention (46.43). Additionally, for the category 'Proficient', the percentage of scores showed a marked increase from 14.29 during the needs assessment to 17.86 on the pre-intervention. Lastly, the percentage of scores decreased for the category 'Distinguished' from the needs assessment (7.14) to the pre-intervention (1.79). Hence, it can be concluded that the percentage of scores reduced by approximately 3% on the category 'Unsatisfactory', 5% on the category 'Distinguished', and improved by approximately 4% on the categories 'Basic'

and 'Proficient' from the needs assessment to the pre-intervention. This improvement in ratings from the needs assessment to the pre-intervention can be attributed to different factors, such as teacher's exposure to collaborative meetings with other team members, increased opportunity to learn about classroom practices as part of different book clubs, and increased comfort in the classroom.

The percentage of scores from the pre and post-intervention on the different categories (unsatisfactory, basic, proficient, and distinguished) of Danielson's Framework of Teaching across all participants are presented in Table 5.9. The percentage of scores on the category 'Unsatisfactory' was reduced as evident by the pre-intervention (33.93%) and post-intervention (8.04%) percentage scores. Similarly, on the category 'Basic', there is a reduction in the percentage scores between pre and post intervention. More specifically, the percentage of scores on the pre-intervention 'Basic' category was 46.43, which decreased to 25% during post-intervention. On the other hand, the percentage of scores has increased from pre to post-intervention on the categories 'Proficient' and 'Distinguished'. On the category 'Proficient', the percentage of scores increased from 17.86 during the pre-intervention to 50.89 during the post-intervention. Also, there was a large increase in the percentage scores from pre (1.79%) to post- intervention (16.07%) for the category 'Distinguished'. The findings indicate an increase in the percentage of scores on the 'Proficient' and 'Distinguished' categories, and a reduction in scores on the 'Unsatisfactory' and 'Basic' categories from pre to post-intervention, demonstrating overall improvement in practices.

Table 5.8:

Percentage of scores from the needs assessment and pre-intervention on the different categories (unsatisfactory, basic, proficient, and distinguished) of Danielson's Framework of Teaching across all participants

	Needs Assessment				Pre-Intervention			
Teacher	Unsat*	Basic	Proficient	Dist**	Unsat*	Basic	Proficient	Dist**
I. Chugh	0	4	4	8	6	5	5	0
E. Shah	8	6	2	0	9	6	1	0
S. Nataraj	9	7	0	0	3	11	2	0
T. Jha	11	5	0	0	2	9	5	0

M. Rehman	10	6	0	0	11	5	0	0
R. Walia	2	9	5	0	0	9	5	2
J. Reddy	1	11	5	0	7	7	2	0
Total	41	48	16	8	38	52	20	2
Percentage	36.61	42.86	14.29	7.14	33.93	46.43	17.86	1.79

Note. *Unsat – Unsatisfactory **Dist – Distinguished

Table 5.9:

Percentage of scores from the pre and post-intervention on the different categories (unsatisfactory, basic, proficient, and distinguished) of Danielson's Framework of Teaching across all participants

	Pre-Intervention				Post-Intervention			
Teacher	Unsat*	Basic	Proficient	Dist**	Unsat*	Basic	Proficient	Dist**
I. Chugh	6	5	5	0	0	2	9	5
E. Shah	9	6	1	0	0	1	11	4
S. Nataraj	3	11	2	0	0	2	10	4
T. Jha	2	9	5	0	0	2	12	2
M. Rehman	11	5	0	0	4	6	6	0
R. Walia	0	9	5	2	1	7	6	2
J. Reddy	7	7	2	0	4	8	3	1
Total	38	52	20	2	9	28	57	18
Percentage	33.93	46.43	17.86	1.79	8.04	25.00	50.89	16.07

Note. *Unsat – Unsatisfactory **Dist - Distinguished

Furthermore, the data from the Danielson's Framework of Teaching was also analyzed for the percentage of scores across the different categories (unsatisfactory, basic, proficient, and distinguished) on the three different domains, namely, planning and preparation, classroom environment, and instruction. The total and percentage of scores from the pre and post-intervention on the different categories (unsatisfactory, basic, proficient, and distinguished) within each domain (planning & preparation, classroom environment, & instruction) of Danielson's Framework of Teaching across all participants is presented in Table 5.10. With regard to the domain of planning and preparation, the table (5.10) shows that the percentage scores on the categories 'Unsatisfactory' and 'Basic' have decreased from pre to post-intervention. The percentage of scores for the 'Unsatisfactory' category on pre-intervention decreased from 33.33% (pre-intervention) to 4.76% (post-intervention). On the other hand, the percentage of scores on categories 'Proficient' and 'Distinguished' increased from pre (16.67% and 0%) to post (59.52% and 11.90%) respectively.

A similar trend was observed with regard to the percentage of scores on the domain of 'Classroom Environment'. The percentage of scores showed a marked reduction on the categories 'Unsatisfactory' and 'Basic', and a significant increase for the categories 'Proficient' and 'Distinguished'. The scores reduced from 20.41% (pre-intervention) to 0% (post-intervention) on the 'Unsatisfactory' category, and from 43.37% (pre-intervention) to 17.14% (post-intervention) on the 'Basic' category. Further, the scores increased from 20.41% during pre-intervention to 48.57% during post-intervention on the 'Proficient' category, and from 5.10% (pre-intervention) to 34.29% (post-intervention) on the 'Distinguished' category. With respect to'Instruction', the percentage of scores reduced from 40.82% during pre-intervention to 20% during post-intervention for the 'Unsatisfactory' category. However, there was only a minimal decrease in the percentage of scores on the 'Basic' category (35.71% in pre-intervention to 34.29% in post-intervention). Approximately 13% of the teachers were proficient prior to the intervention, but 42.86% were proficient after the intervention. Finally, after the intervention, 2.86% scores reflected the distinguished category, when compared to 0%prior to the intervention.

Hence, it can be concluded that teachers' scores on the domains of 'Planning and Preparation' and 'Classroom Environment' had a greater percentage of scores on the categories 'Unsatisfactory' and 'Basic' during the pre-intervention. However, during the post-intervention a higher percentage of scores were 'Proficient' and 'Distinguished' in these two domains. Further, for the Instruction domain the greatest percentage of scores were 'Unsatisfactory' and 'Basic' prior to the intervention. Yet, after the intervention, the percentage of scores identified as 'Proficient' increased significantly, while scores on the category 'Distinguished' increased only minimally. In sum, there were improved classroom practices on all three domains, with larger improvements on the domains 'Planning and Preparation' and 'Classroom Environment'.

Table 5.10:

Total and percentage of scores from the pre and post-intervention on the different categories (unsatisfactory, basic, proficient, and distinguished) within each domain (planning & preparation, classroom environment, & instruction) of Danielson's Framework of Teaching across all participants

Domains & Categories	Pre-Intervention Total	Pre-Intervention Percentage Scores	Post-Intervention Total	Post-Intervention Percentage Scores
Planning & Preparation				
Unsatisfactory	14	33.33	2	4.76
Basic	21	50.00	10	23.81
Proficient	7	16.67	25	59.52
Distinguished	0	0.00	5	11.90
Classroom Environment				
Unsatisfactory	8	20.41	0	0.00
Basic	17	43.37	6	17.14
Proficient	8	20.41	17	48.57
Distinguished	2	5.10	12	34.29
Instruction				
Unsatisfactory	16	40.82	7	20.00
Basic	14	35.71	12	34.29
Proficient	5	12.76	15	42.86
Distinguished	0	0.00	1	2.86

A further analysis of all the teachers reveals certain trends (Table 5.11). Approximately 55% of teachers were rated 'Unsatisfactory' on the components 'designing student assessments', 'organizing physical space', 'using questioning and discussions', and 'using assessments in instruction' during the pre-intervention. However, post-intervention, only one component ('using assessments in instruction') had over 40% of teachers rated as 'Unsatisfactory'. Prior to the intervention, 40% or more teachers received a 'Proficient' rating on only two components, namely 'demonstrating knowledge of content and pedagogy', and 'creating an environment of respect and rapport'. Yet, post-intervention, 40% or more of the teachers got a 'Proficient' rating on 12 components -'demonstrating knowledge of content and pedagogy', 'demonstrating knowledge of students', 'setting instructional outcomes', 'designing coherent instruction', 'designing student assessments', 'creating an environment of respect and rapport', 'establishing a culture for learning', 'managing student behaviour',

'communicating with students', 'using questioning & discussion', 'engaging students in learning', and 'using assessment in instruction'.

Furthermore, prior to the intervention, approximately 15% of teachers received ratings on the 'Distinguished' category for only two components. These included 'creating an environment of respect and rapport', and 'organizing physical space'. Post-intervention, approximately 15% of teachers received ratings on the 'Distinguished' category for 15 components.

Table 5.11:

The percentage of teachers' ratings on different components of the Danielson Framework.

	Pre-Intervention				Post-Intervention			
Component	Unsat*	Basic	Prof**	Dist***	Unsat*	Basic	Prof**	Dist***
Demonstrating knowledge of content and pedagogy	28.57%	28.57%	42.86%	0.00%	0.00%	28.57%	57.14%	14.29%
Demonstrating knowledge of students	28.57%	57.14%	14.29%	0.00%	0.00%	0.00%	100.00%	0.00%
Setting instructional outcomes	0.00%	71.43%	0.00%	0.00%	0.00%	42.86%	42.86%	14.29%
Demonstrating knowledge of resources	28.57%	57.14%	14.29%	0.00%	14.29%	14.29%	28.57%	42.86%
Designing coherent instruction	28.57%	57.14%	14.29%	0.00%	0.00%	28.57%	71.43%	0.00%
Designing student assessments	57.14%	28.57%	14.29%	0.00%	14.29%	28.57%	57.14%	0.00%
Creating an environment of respect and rapport	0.00%	14.29%	71.43%	14.29%	0.00%	0.00%	57.14%	42.86%
Establishing a culture for learning	14.29%	71.43%	14.29%	0.00%	0.00%	28.57%	57.14%	14.29%
Managing classroom procedures	28.57%	71.43%	0.00%	0.00%	0.00%	28.57%	28.57%	42.86%
Managing student behaviour	28.57%	57.14%	14.29%	0.00%	0.00%	0.00%	85.71%	14.29%
Organizing physical space	57.14%	28.57%	0.00%	14.29%	0.00%	28.57%	28.57%	42.86%
Communicating with students	28.57%	71.43%	0.00%	0.00%	0.00%	14.29%	71.43%	14.29%
Using questioning & discussion	57.14%	14.29%	28.57%	0.00%	28.57%	28.57%	42.86%	0.00%
Engaging students in learning	42.86%	28.57%	28.57%	0.00%	0.00%	57.14%	42.86%	0.00%
Using assessment in instruction	71.43%	14.29%	14.29%	0.00%	42.86%	14.29%	42.86%	0.00%
Demonstrating flexibility and responsiveness	28.57%	71.43%	0.00%	0.00%	28.57%	57.14%	14.29%	0.00%

Note. *Unsat – Unsatisfactory **Prof - Proficient ***Dist - Distinguished

Workshop Journal. The workshop journals reflect the anticipated impact of the workshops on teachers' current classroom practices. When asked about how they were planning to implement the ideas introduced during the workshops into their classes, the code *content instructional strategies* identified how well they would use the strategies for language instruction. One teacher noted, "I want to start with background knowledge**.** Before introducing the book I want to give context. Many times I find breakdowns during the reading and I am unable to fill the gaps then" (M. Rehman, personal communication, March 6, 2018). Another teacher noted, "This workshop has introduced the strategies very differently and also explained the concept of active versus passive reading well. I want to start with using this myself - especially the gradual release of responsibility model and think alouds. Also, I want to break up comprehension according to the strategies involved" (M. Rehman, personal communication, January 16, 2018). Finally, E.Shah noted, "While targeting comprehension in my classes, I used different tools and resources but there was no logical flow or build up to bigger things. This workshop has given me a framework and explicit ways to target the same (E.Shah, personal communication, January 16, 2018).

The findings implied that the workshops led teachers to examine their classroom practices and strategies related to literacy instruction, such as activating background knowledge, active reading strategies, and comprehension tools (Danielson, 1996). With regard to strategy, one teacher spoke about the gradual release of responsibility model. Also, another teacher discussed the significance of structure in comprehension instruction.

PLC Meeting. During discussions, teachers addressed how the articles and videos in the PLC meetings influenced their classroom instructional practices. While the teachers were examining different articles, the code *pedagogical instructional strategies* indicated how well the teachers would use instructional strategies. T. Jha stated, "I have used this grouping in one of my classes and I found that it worked well because the students were excited about

new activities" (T. Jha, personal communication, January 24, 2018), and I. Chugh noted, "(Now) when I conference with kids, I don't get into details. I try to zoom out. Or else I can analyze something to death to know it" (I. Chugh, personal communication, March 8, 2018). Lastly, E. Shah analyzed how she used and found success with protocols in her classroom after the shared article discussion. The code *managing classroom procedures* was demonstrated in her response, "The fact that the kids know the protocols makes the process automatic. The concept is to ingrain it into their heads" (E.Shah, personal communication, March 22, 2018).

The teachers discussed the influence of the PLCs on their instructional strategies and classroom procedures. With regard to the former, one teacher highlighted the positive impact of the PLC on grouping strategies in her class. In addition, another teacher added that the PLCs led her to adopt an expanded perspective during student conferencing. Classroom procedures were related to the introduction of protocols in classrooms.

Coaching Meeting. Some of the dialogues between the coach and teachers also revealed the impact of the coaching meeting on teachers' practices within the classroom. For instance, one discussion involving the coach's suggestion about using a gradual release of a responsibility model and scaffolding for students led to a teacher emphasizing its influence on students' learning. The code *pedagogical instructional strategies* is exemplified in the teacher's response, "Now that there is (I am using the) gradual release of responsibility model, they (the students) will always be secure that there is another person they can reach out to. It takes away the fear from learning and gets them to learn more by sharing with peers and the facilitator" (R. Walia, personal communication, January 17, 2018). After observing a session modeled by the coach, the code *content instructional strategies* was evident. M. Rehman stated,

> Based on your class, I got them to generate sentences on their own, (and) asked them added questions on their reading to enhance comprehension. Before I used to just make them read sentences and dictate sentences and words. Now I get them to say and write simultaneously as the multi-sensory approach is better. Earlier I was not doing comprehension like this. I was asking literal questions only from the passage. I like to use more questions now. Actually (now I use) more different questions like who, what, where, when (M. Rehman, personal communication, January 29, 2018).

During another meeting, the coach had proposed the use of a summarizing strategy and visuals to support student's review. The codes *content instructional strategies* and *pedagogical instructional strategies* were also exemplified by S. Nataraj,

> We (I) have tried different reading strategies with (the student) but it has not been successful. When focused, he can think creatively. But in smaller groups he has been all over the place. Even in a larger group, he does participate but needs to be called on. At the end of the class, I am using what you suggested, (namely) summarizing the steps (that) we will use to write script, (and) he has learnt to look at the board and say it from there (S. Nataraj, personal communication, February 15, 2018).

The results indicated that the coaching sessions influenced the teachers' classroom practices, such as introduction of the gradual release of responsibility model, the multi-sensory approach, and specific reading strategies. A teacher highlighted that the discussion meetings with the coach helped her modify the use of questions with her students. Moreover, another teacher discussed her increased use of specific and targeted reading strategies such as summarization in literacy instruction following the coaching meetings.

Teacher Interviews.

Exposure to PD. The teachers highlighted several aspects of the workshop as impacting their classroom practices. The code *pedagogical instructional strategies* was

exemplified. One teacher noted, “When I came in and had discussions and sharing in (the) workshops, I learnt there is no particular way of teaching. (I thought about) how can I (I could) involve movement for (one student) and I did and I saw immense learning” (T. Jha, personal communication, April 4, 2018). The codes *pedagogical instructional strategies* and *managing classroom procedures* were also displayed by J. Reddy who pointed out, “It (the workshops) certainly has helped in current classroom practices as I follow more of a structure now” (J. Reddy, personal communication, April 4, 2018). Furthermore, other teachers also shared about the influence of the workshops and PLC on her practices in the classroom. The codes *pedagogical instructional strategies* and *content instructional strategies* were reflected by two teachers, “The workshops were a great starting point. Also, it definitely taught me how Language can be broken down and scaffolded in the classroom. It helped build my repertoire of classroom activities” (S. Nataraj, personal communication, April 4, 2018), and “For me, PLC was one big doorway and entrance about how to be a language teacher at all. For example, the different components of writing, the steps to follow... PLC has been a good place to learn about teaching. It was a good start and first step” (R. Walia, personal communication, April 5, 2018). The code *content instructional strategies* was indicated by another teacher as she discussed about the applying aspects from the PLC, “I remember while reading the articles, they play(ed) a very critical role. Like I applied the read aloud strategy and started scripting my lesson and now I can confidently do a read aloud” (T. Jha, personal communication, April 4, 2018). In addition, the codes *content instructional strategies* and *managing classroom procedures* were demonstrated by I. Chugh who mentioned, “I learnt many different things that I could do to make my language class better. Right now all I am focusing on protocols. I feel like I'm breaking down things further. Before I didn't break things down so much. I've always used graphic organizers but I have never scaffolded it (I. Chugh, personal communication, March 29, 2018).

With regard to the effect of coaching, E. Shah indicated the extent of the influence when compared to workshops and PLCs. The codes *pedagogical instructional strategies* and *impact of coaching on instructional practices* was demonstrated in her response, "I know a lot that is taught in PLCs and workshops may be relevant to language teachers, but here (coaching) we are only talking about what is relevant to me. So what I get here is a lot more value to me. It has given me so many new ways of thinking about learning and teaching in the class" (E.Shah, personal communication, April 2, 2018). Moreover, the codes *managing classroom procedures, content instructional strategies, pedagogical instructional strategies, impact of coaching on instructional practices,* and *classroom environment* were indicated by M. Rehman,

> I am not organized, does (do) not have resources in place, and the structure of the lesson (is poor). Everything became systematic because you made me aware of it. It got better and better as time passed. My knowledge about PAF (a language program) was low. When I started meeting you, I became aware of PAF and started doing things according to the format, which I never understood before. I learnt many things (from you) so I was able to teach the students many things. While talking to you, we brainstormed many times. If this is the situation, what can be done? For (one student), what do we do when he keeps his hands on his hips. Also (another student's) seating (arrangement) (M. Rehman, personal communication, April 2, 2018).

The intervention influenced different aspects of teachers' classroom instructional practices. A teacher discussed how the workshops led her to consider varied perspectives. Further, another teacher highlighted that the workshops allowed her to be more organized while planning and instructing. Also, other teachers spoke about including specific strategies like the gradual release of responsibility model in the class. Further, the coaching sessions led teachers to deeply examine and focus on practices in their specific classrooms. As a result,

the coaching opportunities within professional development influenced the teachers' practices within their classroom (Neuman & Cunningham, 2009). Content instructional strategy was also used during the interviews. The teachers stated that the PLCs were influential in supporting their literacy instructional practices.

Short-term outcomes. The teachers talked about the influence of their increased reflective practices on their classroom practices. The codes *managing classroom procedures, planning and preparation,* and *impact of reflection on instructional practices* were exemplified by one teacher who stated, "Now I have better class control because of the reflections we have. My classroom management is good and the materials are in place, which is a very big thing. Also (in terms of) lesson planning (as) I can read the skills book before and a lot of time is saved" (M. Rehman, personal communication, April 2, 2018). Another teacher also succinctly described the impact in her comment that was coded *impact of reflection on instructional practices*, "The current classroom practices have stemmed from these reflective practices" (E.Shah, personal communication, April 2, 2018). Additionally, the influence of the increased awareness of beliefs and discrepancies between beliefs and practices on their current instruction was also highlighted during the interviews. A teacher spoke about the effect of embracing new beliefs regarding student learning on her practices. The codes *pedagogical instructional strategies, impact of teacher's beliefs on instructional practices* were indicated by her response,

> Encouraging my children to have a growth mindset, (and) encouraging parents to have an encouraging tone with the children so they can help generalize. (This is a) huge thing for me because I have (a particular student) is in my class, (so I know) that goals and activities can be differentiated and they are not learning the same thing (S. Nataraj, personal communication, April 4, 2018).

Lastly, the codes *pedagogical instructional strategies,* and *impact of teacher's beliefs on instructional practices* were also described by J. Reddy, "(I) understand that if you are willing to let go off all preconceived notions, then there is so much to do" (J. Reddy, personal communication, April 4, 2018).

The effect of the short-term goal, increase in knowledge and skill in constructivist learning and teaching on the teacher's classroom practices was also highlighted during the interviews. The codes *pedagogical instructional strategies* and *planning and preparation* were exemplified by several teachers, "I think I take into account each of the learner's and their styles of learning and differentiate a lot more. I try to do a lot of peer assisted learning and tutoring within the classroom (I. Chugh, personal communication, March 29, 2018), "Now I have many ideas to keep students engaged in so they are not easily bored" (M. Rehman, personal communication, April 2, 2018), and "I would say (it has given me) a better understanding of how to reach out and help children to understand. My role is to facilitate that understanding" (R. Walia, personal communication, April 5, 2018).

The results implied that increased reflective practices during the intervention allowed teachers to enhance their instructional plans, behaviour management practices, and classroom practices. Additionally, teacher's increased awareness of beliefs, and increased knowledge and skill led them to adopt more constructivist classroom practices. The instructional approaches were related to differentiation in practices, group work and collaboration, and student engagement strategies.

Alignment between Teacher's Beliefs and Practices

Table 5.12 indicates the quantitative scores of teachers on the Teacher Belief Survey and the Danielson Framework for Teaching, which can be are used to determine the extent of the relationship between the two. The table (5.12) showed that all teachers have constructivist beliefs as measured by the Teacher Belief Survey and most of the components on the

Danielson Framework fell between the indicators 'Basic' (28 and 25%) and 'Distinguished' (18 and 16.07), with most being 'Proficient'. The highest total (57) and percentage (50.89%) of teacher's ratings on the components fell under the indicator 'Proficient', demonstrating teacher's improved classroom practices. As a result, it can be concluded that teachers with constructivist beliefs also demonstrated proficient classroom practices. However, three teachers received an 'Unsatisfactory' rating on some components, namely "demonstrating knowledge of resources", "designing student assessments", "using questioning and discussion", "using assessment in instruction", and "demonstrating flexibility and responsiveness".

Table 5.12:

The quantitative scores of teachers on the Teacher Belief Survey and the Danielson Framework for Teaching.

	Teacher Belief Survey	**Danielson Framework**			
Teachers	Post-Intervention Approach	Post-Intervention Unsat.*	Post-Intervention Basic	Post-Intervention Proficient	Post-Intervention Dist.**
I. Chugh	CT	0	2	9	5
E. Shah	CT	0	1	11	4
S. Nataraj	CT	0	2	10	4
T. Jha	CT	0	2	12	2
M. Rehman	CT	4	6	6	0
R. Walia	CT	1	7	6	2
J. Reddy	CT	4	8	3	1
Total		9	28	57	18
Percentage		8.04	25.00	50.89	16.07

Discussion

The researcher was interested in determining the impact of the professional development model on teacher's beliefs, efficacy, and practices within the classroom. This section offers a discussion on the findings of the intervention by connecting it to literature studies in the field. The research questions will be used to guide the discussion.

Fidelity of Implementation

Fidelity of implementation highlights if the implementation of the intervention is aligned to the proposed research design (Dusenbury et al., 2003). The first research question focused on the process of implementation and fidelity was described with regard to adherence that is the inclusion of reflective and inquiry practices into each professional development model session, and dosage that is the number, frequency, and duration of professional development sessions, including workshops, PLCs, and coaching sessions. Additionally, the teacher's participation in terms of attendance at the sessions was described as the participant responsiveness at these sessions (Dusenbury et al., 2003).

Dosage. In acknowledging the failure of traditional, workshop models of professional development in impacting change in teachers' practices (Darling-Hammond et al., 2009; Desimone et al., 2002; Penuel et al., 2007), the professional development model included three participant driven workshops on a monthly basis, in addition to weekly coaching and bi-weekly professional learning communities (PLC) meetings over three months. In the study, high fidelity refers to 95% to 100% delivery of sessions, whereas low fidelity indicates less that 80% of sessions delivered as proposed.

The data from the documented session logs from the school's Google drive on a monthly basis demonstrated that all the workshops (100%) as proposed in terms of time, duration, and frequency were delivered during the intervention period. With regard to PLC sessions, 80% of the sessions were delivered as proposed. Even though the PLC sessions were scheduled with prior notice to other school staff members and administrators, one session had to be cancelled due to an unforeseen school event scheduled at the same time. Given the constraints on teacher's schedules and other existing PLC spaces within the school, it was not possible to reschedule the missed PLC session. Lastly, with regard to coaching sessions, there were 11 sessions allotted for each language teacher during the intervention.

Given that there were seven participants in the study, a total of 77 coaching sessions were planned after taking into account individual teacher's timetables, other PLC meeting spaces, and other school events. In spite of prior scheduling, a school event was scheduled at short notice on one of the days during which three coaching meetings were planned. Also, one teacher's coaching session had to be cancelled, as there was an unannounced school holiday due to issues in the city. It was not possible to set up the missed coaching sessions on another day since the teacher's schedules were booked due to upcoming events at the school (sport's day, art show, and annual day). In sum, the delivery of the coaching sessions (94.81%) across the seven teachers at the school can be considered as high in terms of fidelity. Overall, high fidelity was maintained for workshops and coaching sessions, and medium high fidelity for the PLC sessions.

Adherence. Literature shows that providing time and space for teachers to engage in reflective practices, modeling, and inquiry are effective in influencing the teachers' perception of knowledge, beliefs, and resulting practices (Borko, 2004; Desimone et al., 2002; Garet et al., 2001; Larrivee, 2000; Shabeeb & Akkary, 2014). Scholars have also highlighted the importance of creating a safe and trusted space for teachers within the program to honestly share their beliefs and expose themselves (Larrivee, 2000). Hence, the professional development model included reflective and inquiry opportunities for teachers. Additionally, it was ensured that the school leaders ensured that time and space for professional development sessions was factored into the teachers' schedule. A culture of trust was enhanced with the teachers through debriefing and various rapport building activities during the sessions. The study regarded high fidelity as the inclusion of reflective practices into each professional development session. Low fidelity was considered as less than 80% of the professional development sessions including reflective practices.

The data from the school's Google drive documented session logs and audio and video recordings of sessions on a monthly basis revealed that all the professional development sessions (workshops, PLC, and coaching) included reflective and inquiry opportunities to participants. Different forms of reflection and inquiry through video recordings, journals, oral forms, and communities of practice were employed across the different sessions. Additionally, the school's Google calendar revealed that time and space for all professional development sessions were allocated for all teachers. The professional development sessions were all allotted based on discussions between the literacy coach and the teacher, such that there was no overlap with other classes or meetings at school.

The data as indicated by the teacher's responses on an anonymous survey conducted by the school every year related to school culture demonstrated that all the teachers (100%) considered the school environment safe and trusted their peers and leaders. During the coaching meetings, R. Walia stated, "I find these coaching meetings very refreshing. It provides me with a space to discuss specific concerns with you in a non-judgmental manner. I truly value this time with you" (R. Walia, personal communication, March 21, 2018). Also, another teacher added, "I am able to freely talk to you about his (the child's) problems as I know you are able to zoom out and give me perspective. Personally, I feel really assured that you have my back" (J. Reddy, personal communication, February 26, 2018). The teacher's comments during the sessions further depicts that they felt safe and had confidence in the coach during the sessions. In sum, the intervention assured high fidelity with regard to adherence of the professional development sessions.

Participant responsiveness. The additional sub-question targets fidelity with regard to teacher's attendance at the sessions. In this study, high fidelity was referred to 95% - 100% participant attendance at the different professional development sessions, and low fidelity was regarded as less that 80% teacher attendance at more than 10% of the professional

development sessions. Since two teachers unexpectedly left school in the middle of the year due to some personal reasons, the data for only seven teachers were included in the final analysis. The documented session logs from the school's Google drive on a monthly basis displayed that the total teacher participation at the professional development sessions was medium high (91.94%). Even though the teacher's participation at the sessions did not meet the criteria for high fidelity (95% – 100%), it can be seen that all the teachers' attendance at the sessions was above 82%, signifying medium high fidelity.

Short-Term Outcomes

The second research question focused on how exposure to professional development led to the short-term outcomes, which is teachers adopting more reflective practices, increasing their awareness of beliefs and discrepancies between their beliefs and practices, and increasing their perceptions of knowledge and skills in constructivist teaching and learning. The codes used with the qualitative data obtained from teacher's responses during the different professional development sessions, and the teacher's interviews were derived from literature.

Teacher's reflective practices. The teachers at the school regarded the professional development sessions as positively impacting their reflective practices. The teacher's responses across sessions and interviews provided evidence of their increased inspection and thinking about practices, as they were unfolding, referred to as "reflection-in-action" as described by Schon (1983). J. Reddy indicated, "The reflection template you gave me helped during class as I used it to write little pointers that I could refer to later (J. Reddy, personal communication, March 23, 2018). In addition, there were also indications of reflection among participants as retrospective examination of what had occurred in class, assessing what needed to be modified. I. Chugh shared, "[I]n basketball the games are recorded. They go back and look at it and analyze it. So, as described here, in education too emulating that

helps me a lot" (I. Chugh, personal communication, March 8, 2018). This is in line with literature in the field; Schon (1983) has referred to reflection on action as thinking back at one's practices, examining, and evaluating it to further understanding.

The teachers recognized that the structure of the professional development sessions that allowed for collaborative opportunities among participants further enhanced their reflections. The professional development sessions provided teachers with activities to reflect communally. T. Jha observed, "Often we share something we are struggling with and others share how they would tackle it. It helps me reflect more about it" (T. Jha, personal communication, April 4, 2018). Several studies have also identified collaboration as a significant factor in assisting teacher's critical reflections (Ng & Tan, 2009). In addition, the teachers highlighted the significance of two activities within the professional development program that fostered their reflective practices.

Firstly, teachers discussed the significance of dialogue and feedback in fostering their ability to reflect. The professional development was structured to provide teachers with coaching facilities, which has been emphasized in literature as effective in encouraging teacher reflections (Darling-Hammond & Richardson, 2009). Engaging in discussions with a coach lets teachers analyze their practices and beliefs in a detached, neutral manner while rooting it in contextual factors (Harrison, Lawson, & Wortley, 2005; Poom-Valickis & Mathews, 2013). J. Reddy mentioned, "For me, personally I am observing but I am not making sense of the observation. Now I have this opportunity to come and reflect with you and you help me point in the right direction so that I can think about these aspects for myself. Then I can really understand what I am observing and why I need to observe it" (J. Reddy, personal communication, March 5, 2018). According to some researchers, when teachers are provided with opportunities for dialogue and feedback during reflective practices, teachers are prompted to challenge their conclusions, generate new understandings and knowledge,

and approach new issues (Darling-Hammond & Richardson, 2009; Ng & Tan, 2009; Shabeeb & Akkary, 2014), thus influencing their practices.

Secondly, teachers considered the modeling exercises within the sessions as impactful in supporting their reflections. T. Jha stated, "You doing a demo lesson and then reflecting on it aids my reflections too" (T. Jha, personal communication, April 4, 2018). This is consistent with findings from other studies that confirm how modeling offers teachers with the chance to notice, think about, and reflect on teacher practices in the classroom (Coffey, 2014). In addition, Wang and Hartley (2003) highlight that models are more likely to intensify reflections in action. On the whole, the teachers reported the positive influence of the professional development sessions on their reflective practices.

Teachers' awareness of beliefs and discrepancies between their beliefs and practices. Teachers' reflections were also accompanied by an increase in their awareness of their underlying beliefs and the inconsistencies between their beliefs and practices. Schon (1983) has referred to reflection as the ability to express implicit knowledge so that it can be analyzed and linked to supporting beliefs, and influence future actions. Hence, it is essential to emphasize latent beliefs rather than mere thinking about practices during professional development (Shabeeb & Akkary, 2014). Several of the teacher's responses revealed evidence of the teacher's increased awareness of the lack of alignment between their beliefs and classroom practices. J. Reddy indicated, "Honestly, as a teacher we need to go into such minute details, break down each task into the smallest component depending on the needs of the child. Yet, sometimes I forget to break it down" (J. Reddy, personal communication, April 4, 2018). Also, T. Jha mentioned, "In trying to achieve my (daily) goals, I sometimes forget to zoom out and address other concepts that will eventually help with the bigger goal" (T. Jha, personal communication, March 22, 2018). Literature studies provide evidence of increased awareness of discrepancies between beliefs and practices to some of the tools used

within the professional development program, such as focused journaling, discussions during coaching, and video reflections within the PLC meeting spaces (Díaz Larenas et al., 2013; Farrell & Ives, 2015; Ng & Tan, 2009), which were included within this study's intervention.

Besides, the qualitative data demonstrated that teachers highlighted three issues with regard to their awareness of the discrepancy between beliefs and practices. Firstly, teachers were aware of their limited beliefs and practice due to lack of understanding. J. Reddy indicated "Earlier I had only a birds' eye view and did not know how to translate it to classroom practices" (J. Reddy, personal communication, April 4, 2018). Secondly, teachers were uncertain of their beliefs and practices. R. Walia stated, "On one hand we are empowering the child to be independent and live on his own and yet be inclusive simultaneously and collaborate with others. It is sometimes a challenge to know how much to let go and how much to hold on to. It is a confusing mix and a delicate balance" (R. Walia, personal communication, January 17, 2018). Thirdly, teachers discussed their difficulty in aligning their beliefs and practices. E. Shah mentioned, "You help me see that collaboration is important but paired discussions has not worked as expecting them to have a conversation does not work. Group work is not really happening" (E.Shah, personal communication, January 18, 2018).

These aspects are also supported by literature studies related to teacher beliefs, and more specifically India. Since teacher's beliefs are the combined result of personal life experiences, experiences as a student, and experiences with formal knowledge (Enderle et al., 2014; Richardson, 1996; Riojas-Cortez et al., 2013; Tillema, 2000), the teachers' beliefs are well constructed before they enter training programs (Murphy et al., 2004). Moreover, as teachers in India are more likely subjected to traditional approaches to learning and teaching (Batra, 2005), and they have received limited opportunities to challenge their beliefs, teachers are ambiguous regarding their beliefs and tend to adopt cultural aspects embedded into Indian

educational institutes (Nargund-Joshi et al., 2011). In addition, Theriot & Tice (2009) highlight that teachers' articulating and espousing certain beliefs about teaching does not warranty the transference of these beliefs into instructional practices, due to the teachers' lack of knowledge in dealing with unanticipated hindrances and barriers. Additionally, India continues to adopt a centralized policy-making practice that allows the teacher training curriculum to be developed by individuals removed from specific contexts of teaching, resulting in lack of consideration of contextual influences (Dyer et al., 2004). Hence, teachers have difficulty merging their beliefs and their practices, even when based on newly acquired notions of learning and teaching.

The teacher's responses further indicated that they were able to become aware of the discrepancy between their beliefs and practices based on acquired knowledge and understanding during professional development. I. Chugh said, "I realize now that I do model but don't use the same thinking stems and hence the children are not picking it up. In my head I thought I was doing it right" (I. Chugh, personal communication, January 16, 2018). Research findings also reveal that when teachers are provided with opportunities for questioning, sharing, and discussions during professional development, the teachers are more likely to examine their beliefs and practices in a more objective manner while allowing for perspective sharing on practices that are contextual (Harrison, Lawson, & Wortley, 2005; Poom-Valickis & Mathews, 2013).

Conclusively, it was observed that teacher's exposure to professional development led to an increase in teacher's awareness of the discrepancies between their beliefs and practices.

Teacher's perceptions of knowledge and skills in constructivist teaching and learning. The teacher's perceptions of knowledge and skills in constructivist teaching and learning were enhanced as indicated by teacher's responses during the professional development sessions and the interviews. Constructivism regards learning as construction

rather than mere acquisition of knowledge (Cunningham & Duffy, 1996; Von Glasersfeld, 2012).

Some of the teachers highlighted aspects related to their constructivist pedagogical practices. This was exemplified by M. Rehman's statement, "Teaching students how to give feedback (by) commenting on steps they used, difficulties they faced can help themselves and their peers in understanding the possible pitfalls and advantages (M. Rehman, personal communication, March 8, 2018). Tam (2000) emphasized that a constructivist perspective regards peer interaction as significant as learners are provided with opportunities for collaborative dialogue to assess and modify their perceptions, notions, and knowledge.

Additionally, some teachers also spoke about the influence of professional development sessions on their constructivist literacy practices in particular. E. Shah mentioned, "[It] showed me how determining importance and background knowledge activation is used to improve comprehension" (E.Shah, personal communication, March 6, 2018). This is aligned to research related to constructivist pedagogy in reading instruction, which includes skills such as activating schema knowledge, self-monitoring, self-questioning, explicit comprehension metacognitive strategy, and reviewing the text.

Lastly, teachers also discussed the active role of the learner epitomized in a constructivist perspective. Literature also signifies that the learner's role in constructivism is paramount. This is underlined by Woolfolk (1983) in her book 'Educational Psychology', "The key idea is that students actively construct their own knowledge: the mind of the student mediates input from the outside world to determine what the student will learn. Learning is active mental work, not passive reception of teaching" (p.485). I. Chugh indicated, "Teaching (comprehension) strategies explicitly to children allows them to stay engaged in the process by being active participants rather than just reading the words on the page" (I. Chugh, personal communication, January 16, 2018).

Medium-Term Outcomes

The last research question focused on how exposure to the professional development and the short-term outcomes that is increase in teacher's reflections, awareness of beliefs and discrepancies between beliefs and practices, and perceptions of knowledge and skills in constructivist practices lead to the medium-term outcomes. These medium-term outcomes include teachers modifying their beliefs regarding learning and teaching, their efficacy, their instructional practices in the classroom, and the alignment between their beliefs and practices.

Teacher beliefs. Quantitative and qualitative data were used to establish the positive influence of professional development and the short-term outcomes on teacher beliefs. The Teacher Belief Survey (TBS) results demonstrated that the teacher's constructivist beliefs changed dramatically from the needs assessment to post-intervention. Evidence for this was reflected from the change in percentage of teachers adopting constructivist beliefs during the needs assessment (0.14%) to post-intervention (100%). These findings provide evidence that professional development and the short-term outcomes were successful in modifying teacher's beliefs to more constructivist ones.

These findings were further supported by qualitative data from the study. The teacher's responses during the professional development sessions and interviews indicated that teacher's beliefs could be categorized into different categories, such as beliefs about learning, beliefs about teaching, beliefs about the role of a teacher, and beliefs about the role of a learner. For instance, belief about teaching was reflected in the comment by T. Jha, "Actually, each learner has their own style and teachers must understand that before teaching" (T. Jha, personal communication, March 6, 2018). Further, the statement "It is important for the child to read. The more the child reads, the more the background knowledge. Then they can connect more and the more they are able to make sense" (R. Walia, personal communication, January 24, 2018) indicates beliefs related to learning and

the role of a learner. Also, M. Rehman expressed her belief about the role of a teacher, "I need to understand it (comprehension strategies) fully before using it in classes. I realize that I have to be open to learning myself (M. Rehman, personal communication, February 6, 2018). The classification of beliefs into different groups has also been attempted by other researchers in the field in order to study the resulting impact (Pederson, 2003). For instance, in one study, teacher's beliefs were organized into five areas, namely, beliefs about learning and teaching, beliefs about teaching, beliefs about the subject, beliefs about learning to teach, and beliefs about self and the teaching role (Calderhead, as cited by Uztosum, 2013).

Besides, teacher's responses also considered the source of teacher's beliefs, which is based on personal and professional experiences of the teachers. S. Nataraj discussed her beliefs due to professional experiences, "I came in thinking that's (learning from a textbook is) how learning or teaching is. However, this (professional development) showed me that learning is about skills and building on those required in the 21st century. It was more meaningful too" (S. Nataraj, personal communication, April 4, 2018). On the other hand, T. Jha addressed belief through personal experiences, "(I) walked in to Gateway with a certain belief like I have to do 10 worksheets" (T. Jha, personal communication, April 4, 2018). The impact of different experiences on beliefs is also found in research. Teachers' beliefs are formed as a result of their personal and professional experiences (Riojas-Cortez, Alanis, & Flores, 2013; Tillema, 2000). Other scholars have found the school environment to be more potent than pre-service teacher training in defining teachers' beliefs (Massengill et al., 2005).

Overall, the teacher's scores on the survey and the teacher's responses during sessions and interviews indicated that the professional development sessions, which included opportunities for collaboration, reflection, dialogues, and active participation of members led teachers to alter their beliefs to constructivist approaches about learning and teaching. Other research studies have also highlighted the positive impact of certain professional

development activities such as structured discussions, collaboration, and reflective practices in amending teacher's beliefs (Arce, et al., 2014; Carrington et al., 2010).

Teacher efficacy. The study found that teacher's efficacy showed an improvement due to exposure to professional development as reflected in the shift in their average total efficacy score from pre-intervention (65.86) to post-intervention (67.29), and the percentage change scores from pre-intervention to post-intervention (2.17). Bandura (1977) broke down self-efficacy into personal self-efficacy, that is the individual's belief that he or she is competent in performing a task, and outcome expectancy, which is the individual's belief that the purposiveness and performance of a task will lead to favorable outcomes. Further analysis of the data from the study revealed that even there was a significant improvement in teacher's personal teaching efficacy scores (the percentage change scores from pre-intervention to post-intervention = 9.77), but no positive shift in teacher's general teaching efficacy (the percentage change scores from pre-intervention to post-intervention = -8.21).

The increase in teacher's personal teaching efficacy can be attributed to the content of the professional development sessions. Bandura (1997) discussed four sources of efficacy - mastery experiences, vicarious experiences, social persuasion, and physiological and affective states. In this study, mastery experiences were provided as teachers tested and used several effective classroom planning and instructional strategies with students in their classrooms. Second, vicarious experiences were provided during the intervention through opportuntities that introduced teachers to effective classroom strategies. These experiences were provided through resources on theoretical perspectives on teaching during the workshops, video recordings and peer sharings during the PLCs, and modeling by the language coordinator during the coaching sessions. Social persuasion was addressed when the coach provided teachers with encouragement, feedback, and motivation during their professional development experiences. Lastly, physiological and affective states were offered

as the coach built rapport with the participants during the professional development sessions and ensured that a culture of trust led to a safe and non-threatening environment. In doing so, teachers could engage in deep reflection and sharing with their peers. The positive effect of professional development sessions on teacher's personal teaching efficacy was further supported by teacher comments. During the interviews, some teachers examined the impact of the professional development sessions on their personal teaching efficacy beliefs.

The increase in teacher's personal teaching efficacy and not general teaching efficacy can be also related to the extent to which the intervention focused on different teacher's beliefs (Fives, 2003). During the intervention, the language coordinator targeted teacher's beliefs related to personal teaching efficacy. Personal teaching efficacy is the teacher's beliefs about their own abilities and feelings of confidence with regard to teaching abilities, skills, and tasks during the different professional development sessions. For instance, teachers were guided to determine their beliefs related to teaching and learning, such as lesson planning, testing new strategies, experimenting with different tools and resources during the workshops, PLCs, and coaching sessions. However, general teaching beliefs, which are teachers' beliefs about the general power of teaching to positively influence student outcomes, were not addressed explicitly during the sessions. Additionally, research demonstrates that general teaching beliefs, like those related to learning disabilities, or stereotypes about people are generally more fixed and difficult to change (Chandler, 2014).

However, the increase in total efficacy as a result of professional development sessions in this study are in agreement with findings from other studies situated in varied contexts (Henson, 2001; Lotter et al., 2018, Ortaçtepe & Akyel, 2015, Yoo, 2016).

Teacher's classroom practices. Since teachers are responsible for student learning (Harbour et al., 2015), they employ a range of instructional delivery methods, and tools that help connect the curriculum to the student (Stronge et al., 2011). Teachers in this study do

reveal an improvement in their classroom instructional practices as indicated by their scores on the Danielson's Framework of Teaching. The teacher's ratings showed a reduction in percentage scores on the categories 'Unsatisfactory' (26%) and 'Basic' (21%) from pre to post-intervention. Yet, there was an increase in percentage scores on the categories 'Proficient' (33%) and 'Distinguished' (14%) from pre to post-intervention.

Further analysis also showed teacher's improved practices from pre to post-intervention. The results revealed that the teacher's scores were higher on the categories 'Unsatisfactory' and 'Basic' during the pre-intervention on the different domains, namely, 'Planning and Preparation', 'Classroom Environment', and 'Instruction'. However, during post-intervention, the teacher's scores were greatest on the categories 'Proficient' and 'Distinguished'.

Additionally, analysis of the qualitative data from teacher's responses demonstrated that the professional development sessions were successful in influencing different aspects of teacher's instructional practices, such as those related to content instruction, pedagogical instruction, classroom procedures, classroom environment, and planning and preparation. M. Rehman highlighted aspects related to content instruction,

> Based on your class, I got them to generate sentences on their own, (and) asked them added questions on their reading to enhance comprehension. Before I used to just make them read sentences and dictate sentences and words. Now I get them to say and write simultaneously as the multi-sensory approach is better. Earlier I was not doing comprehension like this. I was asking literal questions only from the passage. I like to use more questions now. Actually (now I use) more different questions like who, what, where, when (M. Rehman, personal communication, January 29, 2018).

On the other hand, R. Walia indicated aspects related to pedagogical instruction in her statement, "Now that there is (I am using the) gradual release of responsibility model, they

(the students) will always be secure that there is another person they can reach out to. It takes away the fear from learning and gets them to learn more by sharing with peers and the facilitator" (R. Walia, personal communication, January 17, 2018). E. Shah addressed procedures in the class as she stated, "The fact that the kids know the protocols makes the process automatic. The concept is to ingrain it into their heads" (E.Shah, personal communication, March 22, 2018). Further, M. Rehman discussed classroom environment, "I am not organized, does (do) not have resources in place, and the structure of the lesson (is poor). Everything became systematic because you made me aware of it. It got better and better as time passed" (M. Rehman, personal communication, April 2, 2018). Lastly, with regard to planning and preparation, I. Chugh said, "I think I take into account each of the learner's and their styles of learning and differentiate a lot more" (I. Chugh, personal communication, March 29, 2018). These aspects of classroom practices are based in research and are included in the Danielson Framework of Teaching.

In addition, the teachers also discussed the influence of different components, like coaching, reflection, and teacher's beliefs on their practices. M. Rehman highlighted the influence of coaching, "When I started meeting you, I became aware of PAF and started doing things according to the format, which I never understood before. I learnt many things (from you) so I was able to teach the students many things" (M. Rehman, personal communication, April 2, 2018). Neuman & Cunningham (2009) also found the coaching as part of professional development most effective in impacting practices for teachers in classrooms.

E. Shah covered the influence of reflection in her comment, "The current classroom practices have stemmed from these reflective practices" (E.Shah, personal communication, April 2, 2018). This is aligned to studies showing how reflection in professional development was effective in influencing teacher's practices in the classroom (Coffey, 2014; Wang &

Hartley, 2003). Also, S. Nataraj spoke about the impact of her beliefs on her practices in stating,

> Encouraging my children to have a growth mindset, (and) encouraging parents to have an encouraging tone with the children so they can help generalize. (This is a) huge thing for me because I have (a particular student) is in my class, (so I know) that goals and activities can be differentiated and they are not learning the same thing (S. Nataraj, personal communication, April 4, 2018).

Several literature studies demonstrate how teachers' beliefs influence their teaching practices (Chan et al., 2007; Doruk, 2014; Fajet et al., 2005; Kukari, 2004; Moore, 2008; Stuart & Thrulow, 2000; Taskin-Can, 2011; Yilmaz & Sahin, 2011). Fives & Buehl (2008) also emphasize that teachers' beliefs function as filters, affecting the teachers' interpretation of events; as frames in explaining the problems at hand; or as guides, in impacting teachers' actions.

In conclusion, the professional development and short-term outcomes had a positive effect on teacher's classroom practices. These results are consistent with research findings from the field that demonstrate teaching practices as developed and enhanced through teacher professional development programs (Borko 2004; Richardson and Placier 2001; Yoon et al. 2007).

Alignment between teacher's beliefs and practices. The study results also highlighted an interesting relationship between teacher's beliefs and practices. The results from two of the instruments used in the study, the Teacher Belief Survey and the Danielson Framework of Teaching showed that all the teachers who espoused constructivist beliefs had improved classroom practices, as indicated by their highest percentage ratings on the indicator 'Proficient' (50.89%) during post-intervention.

Limitations

The study was conducted in a single special need, private, urban school with a limited number of participants (N=7) that lacks diversity. As a result, the generalizability of the findings from the study is limited (Shadish et al., 2002). On the other hand, the small sample size had both scholarly and practical implications. From a scholarly perspective, the sample size was advantageous as it allowed for deep investigation of change in teacher's beliefs and practices within the classroom following the intervention (Cassell & Symon, 2004; Crouch & McKenzie, 2006). Hence the mixed method paradigm was an appropriate choice of design in this study as the qualitative data obtained was valuable in analyzing the change in teacher's classroom practices and beliefs related to teaching, and learning (Creswell & Plano Clark, 2011). Furthermore, research related to the impact of participant-driven workshps, PLCs, and coaching on teacher's beliefs and practices has not been conducted in the context. As a result, the small sample size was suitable in providing an understanding of the same on a small scale before exploring the impact of the intervention on a large scale. Practically, the small size was beneficial to the participants. Specifically, the small sample size allowed for a manageable intervention where teachers could receive one-to-one coaching, and an intimate PLC meeting space that led to open sharings and discussions. Hence, the small sample size allowed teachers to receive adequate attention during the intervention, which would have not been possible with a large sample size, and a single researcher.

Additionally, the study lasted for duration of three months during which the impact of professional development on teacher's beliefs and classroom practices were studied. Due to the short duration of the intervention, it was not possible to assess the effect of professional development on student's literacy outcomes. Hence the duration of the study can be considered a limitation.

Other limitations relate to the instruments used in the study. The Teacher Belief Survey used to measure teacher's constructivist and traditional beliefs was a self-reporting

instrument, which is more likely to introduce bias as participants' responses may reflect what they feel is ideal, expected, or socially desirable rather than their actual beliefs. Further, the teacher's responses on two of the instruments, the Teacher Belief Survey, and the Teacher Efficacy Scale, may be impacted by their exposure to the scale (Shadish et al., 2002), as they were delivered twice that is prior and post the intervention. In addition, the researcher was the only observer used for teacher's classroom practices in the study, which could introduce bias into the ratings on the Danielson Framework of Teaching tool used in the study.

Moreover, the study lacked a control group (Shadish et al., 2002) and hence used a pre-post design, which makes it difficult to ascertain if the difference in scores were due solely to the treatment. As a result, the design only allowed for assessing changes in scores before and after the professional development intervention implementation rather than causal effects of the intervention.

Although this study did have limitations with regard to the setting, sample, duration, instruments used, and design, the findings yet have implications for research, practitioners, and policy makers, which are discussed below.

Implications for Researchers

As this study was limited to a single special needs urban school with a limited number of participants (N=7), a larger and more variable sample size across different school settings will be a significant consideration. Including a larger number and variety of participants from various settings will allow for greater generalizability of the results. In addition, this study analyzed the data and reports the results for English language teachers. Future research may examine beliefs and practices of teachers in other subject areas.

This study was implemented for duration of three months during which the impact of the professional development model on teacher's beliefs and practices was studied. However, in order to study the resulting influence on student outcomes, it will be necessary to study the

execution of professional development over an extended duration of time. This would allow teachers sufficient time to identify, challenge, and modify their beliefs, alter their classroom practices so that they are aligned to their constructivist beliefs, and influence student outcomes. This is consistent with research, which demonstrates that changing beliefs is a long-term process and cannot be achieved within short periods of time (Beck et al., 2000; Caudle & Moran, 2012; Murphy et al., 2004). Hence, professional development provided on an ongoing basis over longer durations may provide results that are noteworthy with regard to student outcomes.

In addition, alterations in the design of the intervention can be further examined. The workshops can be provided through an online platform such as Google classrooms while continuing to allow members to actively participate and reflect by designing different activities and assignment submissions embedded into the session. Also, this will allow the workshop sessions to be staggered across weeks rather than limited to a stand-alone session. Research in the field also indicates the ineffectiveness of workshop oriented professional development that provides teachers opportunities within a fixed schedule (Clarke & Hollingsworth, 2002; Ng & Tan, 2009; Spilkova, 2001). Also, the online format will provide teachers with considerable flexibility in their schedules and result in increased participation in the sessions. Lastly, workshops provided online will result in decreased human resource for the delivery of the sessions across different groups of participants. The online workshop model sessions can also be generalized across different settings depending on the needs of the participants, thus maximizing time and effort.

Future research can also target student's performance gains and experiences within classrooms where teacher's self-efficacy and classroom instructional practices have changed. Furthermore, research related to the impact of the different aspects of the intervention can be studied in further depth. For instance, during the teacher interviews, several teachers

highlighted that the coaching sessions were most influential in leading to changes in their beliefs about teaching and learning and classroom practices. Hence, future research endeavors can focus on the effect of coaching as the most effective components of the intervention that led to teacher change.

Further research can also explore areas that failed to show improvement after the intervention in order to determine more effective approaches for improvement. These areas include instructional components such as 'demonstrating knowledge of resources', 'designing student assessments', 'using questioning & discussion', 'using assessment in instruction', and 'demonstrating flexibility and responsiveness' following the intervention.

Lastly, this study highlighted the importance of leadership support (Avolio et al., 2004; Jensen and Luthans, 2006). Future research can more deeply explore this necessary component by aiming to understand aspects of leadership that can support a successful intervention such as establishing and mainintaining trust. Tschannen-Moran and Wayne Hoy (2014) have delineated five elements on which people base their trust, namely, benevolence, honesty, openness, reliability, and competency (Tschannen-Moran, 2014). As a result, research that examines these leadership characteristics can further support a better understanding of how this contextual factor supports an intervention of this kind.

In sum, this study provides opportunities for researchers to implement the intervention with a larger and wider sample of participants, for addition content areas, increased duration, a modifed design, the inclusion of children's experiences within classrooms, and additional outcomes to explore specific components of the intervention on changes in teacher's beliefs and practices and the role of leadership support for the success of the intervention.

Implications for Practitioners and Schools

The networked ecological systems theory (Neal & Neal, 2013) acknowledges the

interactions between different individuals within the five subsystems that guide human growth; the microsystem, mesosystem, exosystem, macrosystem, and chronosystem. The results of the needs assessment demonstrated that individuals in the school microsystem impacted the student in this study. More specifically, the results indicated that teacher's constructivist beliefs about learning and teaching had a positive impact on teacher practices in the classroom, and improved student outcomes (Shah, 2016). In addition, this study's intervention results show evidence that a professional development model rooted in constructivist principles, which provides teachers with reflective opportunities through different platforms, including workshops, PLC, and coaching sessions is effective in positively influencing the teachers' beliefs about learning and teaching and classroom practices (Shah, 2018).

The positive impact of the intervention on teacher's beliefs and efficacy has significant implications. First, the implication of teacher's modified beliefs about learning and teaching will be realized with respect to inclusive classrooms. Rather than creating special and limited practices and spaces for students with learning difficulties, the teachers' modified constructivist beliefs about learning and teaching will result in greater acceptance of inclusion as a possibility in education, thus altering the experience of students in the classroom. Secondly, the postitive impact of the intervention on teacher's beliefs and practices can also affect sustainability and scale up initiaitves in the field. The study demonstrated that certain key contextual ingredients were observed with regard to the implementation of the intervention, such as establishing and maintaining a strong culture of trust among participants and the language coach, as well as high to medium high fidelity with regard to dosage, adherence and participant responsiveness, in order to achieve the anticipated outcomes. Hence, these aspects must be considered while examining the implementation of the intervention for future sustainable and scale-up projects and studies.

Since research demonstrates that teachers' instructional or teaching practices in the classroom are most effective in impacting student achievement (Batra, 2005; Desimone, 2009), it follows that improving student outcomes in schools is closely linked to modifying teachers' classroom practices (Desimone, 2009; Neuman & Cunningham, 2009). Hence, providing teachers with professional development models based on a social constructivist perspective, which regards learning as a process of knowledge construction based on an interaction between the individual learner and his or her environment, through a reflective process (Aldrich & Thomas, 2005; Dagar & Yadav, 2016) can be effective in influencing teacher's beliefs and classroom practices, and resulting student outcomes. Since reflections can be realized by "deliberately structuring reflective learning processes" and by "removal of the impediments of the culture of taking directives and initiatives from the top" (Ng & Tan, 2009, p. 41), it follows that school leaders and administration will need to motivate teachers to become aware of their beliefs by providing a rationale for the intervention. Accordingly, this calls for a more participative leadership style that fosters teachers to reflect on their beliefs underlying their practices in the classroom.

As one of the contributing factors shaping teachers' beliefs about teaching and learning is teacher's personal and professional experiences over several years (Riojas-Cortez et al., 2013; Tillema, 2000), teachers may be resistant to change their beliefs. It follows that effecting change in beliefs is a long-term process and cannot be achieved within short periods of time (Beck et al., 2000; Caudle & Moran, 2012; Murphy et al., 2004), as teachers need time to first become mindful of their incongruous beliefs and practices and then engage in thoughtful practices (Helsing et al., 2008; Riojas-Cortez et al., 2013; Yilmaz & Sahin, 2011). So, if schools decide to implement this professional development model, the school leaders and administration will need to ensure that the professional development model is provided on an ongoing basis for a long-duration, and make the necessary provisions within teachers'

schedules so that they can engage in professional development successfully (Jensen and Luthans, 2006; Vroom, 2003). Therefore, schools will need to set their priorities on the provision of professional development for teachers by incorporating the features of effective professional development from literature findings, and providing the resources and infrastructure required for the intervention.

Implications for Policy Makers

Malen (2006) discusses how institutions and the sociocultural values surrounding its context lead to the establishment of structures of authority and rules for management, which influence the power games in the context. This study highlights the significance of a planned, ongoing model of professional development rooted in constructivist principles in affecting teacher's beliefs and classroom practices. Most schools in the local context do not have a systematic professional development design due to lack of administrators' support resulting from poor understanding regarding effective professional development. Further, schools do not have the necessary resources, tools, and infrastructure to implement an ongoing professional development model. The current study can inform the local district and state to develop and provide the necessary standards, framework, funding, and technical support to enable schools to deliver effective professional development sessions to their teachers.

In addition, given that the margins of government and private schooling systems are being redefined, the earlier perception of the government as the sole provider of education is being challenged and there is greater acceptance of private education institutes (Meyer, 2006, p.218). The Gateway School of Mumbai aims to provide each student their pathway to success by encouraging a shift in society's outlook towards individuals with disabilities so that they are regarded as equally capable individuals who can contribute to society. Institutions are evaluated not by the extent to which they achieve the identified goals, but instead by the extent of their contribution to social order and stability (Meyer, 2006). As a

result, the organization has both, a Research, and an Outreach team, that aims to actively consolidate the learning generated through the application and assimilation of data-driven practices at the school, and share the tools, approaches, strategies, and understandings with other mainstream and special education needs schools across the nation. Through these endeavors, the school aims to foster the possibility of schooling as disparate from the traditional approach of rote learning. The organization strives to shift the perception of schooling as limited to the diffusion of knowledge, and extend it to a decentralized, flexible, organic process in order to prepare students for the knowledge society (Meyer, 2006).

Since the vision of the school extends to creating an impact in the larger context of the country, the next step will involve extending its influence to government schools. Even though the government schools are increasingly accommodating students with learning difficulties, and establishing new reform measures, the teachers continue to be ill prepared to effectively provide for students in their classrooms (Bhatnagar & Das, 2013). In addition to the existing Maharashtra State Board for Secondary and Higher Secondary Education that continues to be dominated by traditional teaching, and assessment practices, the Education Department of Mumbai, India recently issued a proposal regarding the setting up of an additional autonomous board called the Maharashtra International Education Board (MIEB). As a pilot project, this new board, MIEB, will identify ten shortlisted schools from the state as model schools, which will be in charge of supporting nine other schools each towards establishing a more international framework. Hence, the pilot project will include ten existing government model schools and additional 90 schools. The schools will impart primary, secondary, and higher secondary education, and have the authority to affiliate schools from other states.

This project aims to be rooted in more constructivist principles of learning and teaching, shifting away from more traditional frameworks in the existing state schools. Given

the existing dearth of teacher training opportunities in our country, the existing traditional frameworks, and the newly adopted framework, it would be imperative to first provide a robust teacher training system to equip the teachers effectively to provide the international curriculum. Further, keeping in line with the vision of the Gateway School, close collaboration with the government on pilot projects is actively sought through the school's Outreach department as an entry pathway towards impacting the larger context. The professional development model can first be experimented with the ten schools, and if the preliminary results are satisfactory, it can be extended to the associated 90 schools. In addition, if the model proves to be effective with the identified 100 schools, it can be pushed further to other sets of government schools that will be included within the new board. Hence, it will result in achieving a wider impact, while simultaneously keeping in line with the school's vision.

Conclusion

This study demonstrates that a professional development model rooted in constructivist principles is effective in positively impacting teacher's constructivist beliefs and classroom practices. This study is significant as it contributes to literature in the field by highlighting the implications of a professional development intervention including workshops, PLCs, and coaching facilities on teacher's beliefs and classroom practices. The study has extended research in the field by highlighing the critical need to address teachers' beliefs, which interfere with constructivist teaching approaches in the classroom during teacher education. Hence, the traditional teacher education models that are currently employed in the country will need to be transformed. This research also has the potential to impact the full range of public schools in the country by collaborating with the government on pilot projects. Findings suggest that supportive leadership is required to provide an

ongoing, long-term professional development model within schools and allow teachers to engage in reflective opportunities across different platforms.

Since the proposed professional development model is a shift from the existing traditional workshop models of teacher training, it will be imperative to highlight the goals of different stakeholders involved in order to impact policy. Yet, the answer to challenges with student achievement cannot be fixed with a "..easily identifiable silver-bullet solution" (Manna, 2012, p. 641). Teacher's instructional practices are one of significant factors impacting student's comprehension skills (Guo et al, 2012). Hence it is essential that all stakeholders partake during the implementation, and acknowledges that the intervention is to be delivered on an ongoing, long-term basis for the impact on student achievement to be realized (Hess, 2008). Professional development must extend beyond the current emphasis on content-focused goals through isolated workshops as it is recognized that teacher practices in the classroom are impacted by their beliefs (Kukari, 2004; Koutselini & Persianis, 2000; Moore, 2008; Taskin-Can, 2011) and their self-efficacy (Tschannen-Moran & Hoy, 2001).

> "My vision of professional development is grounded in faith in teachers, the institutions they work for, and the power of the broader community of educators around the country and the globe. Effective professional development should be understood as a job-embedded commitment that teachers make in order to further the purposes of the profession while addressing their own particular needs. It should follow the principles that guide the learning practices of experienced adults, in teaching communities that foster cooperation and shared expertise" (Diaz-Maggioli, 2004).

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Appendix A

Learning Profile Questionnaire

Instructions: Circle the option that best describes you.

1. I study best when it is quiet.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

2. I am able to ignore the noise of other people talking while I am working.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

3. I like to work at a table or desk.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

4. I like to work on the floor.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

5. I work hard for myself.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

6**.** I work hard for my parents or teacher.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

7. I will work on an assignment until it is completed no matter what.

1	2	3	4	5	6	7
completely	disagree	somewhat	neutral	somewhat	agree	completely

disagree disagree agree agree

8. Sometimes I get frustrated with my work and do not finish it.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

9. When my teacher gives an assignment, I like to have exact steps on how to complete it.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

10. When my teacher gives an assignment, I like to create my own steps on how to complete it.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

11. I like to work by myself.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

12. I like to work in pairs or in groups.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

13. I like to have an unlimited amount of time to work on an assignment.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

14. I like to have a set amount of time to work on an assignment.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

15. I like to learn by moving and doing.

1	2	3	4	5	6	7
completely	disagree	somewhat	neutral	somewhat	agree	completely

disagree		disagree		agree		agree

16. I like to learn while sitting at my desk.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

17. I like to listen to others read to me.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

18. I like to read for myself.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

19. I like to think things out.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

20. I like to discuss things with others right away.

1	2	3	4	5	6	7
completely disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	completely agree

Appendix B

Framework for Teaching Observation Sheet

		Teacher 1				Teacher 2				Teacher 3				Teacher 4			
Domain	**Component**	U	B	P	D	U	B	P	D	U	B	P	D	U	B	P	D
Planning & Prepara-tion	1a. Demonstrating knowledge of content and pedagogy																
	1b. Demonstrating knowledge of students																
	1c. Setting instructional outcomes																
	1d. Demonstrating knowledge of resources																
	1e. Designing coherent instruction																
	1f. Designing student assessments																
Classroom Environ-ment	2a. Creating an environment of respect and rapport																
	2b. Establishing a culture for learning																
	2c. Managing classroom procedures																
	2d. Managing student behaviour																
	2e. Organizing physical space																
Instruc-tion	3a. Communicating with students																
	3b. Using questioning and discussion techniques																
	3c. Engaging students in learning																
	3d. Using assessment in instruction																
	3e.Demonstrating flexibility and responsiveness																

Appendix C

Teacher Belief Survey

Instructions: Imagine how you will set up your own future classroom as you read each of the following survey statements. As you think about your classroom, write a number on the line beside each statement to indicate how much you disagree or agree with the statement on a scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

1. It is important that I establish classroom control before I become too friendly with students.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

2. I believe that expanding on students' ideas is an effective way to build my curriculum.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

3. I prefer to cluster students' desks or use tables so they can work together.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

4. I invite students to create many of my bulletin boards.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

5. I like to make curriculum choices for students because they can't know what they need to learn.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

6. I base student grades primarily on homework, quizzes, and tests.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

7. An essential part of my teacher role is supporting a student's family when problems are interfering with a student's learning.

1	2	3	4	5	6
strongly	disagree	somewhat	somewhat	agree	strongly

disagree disagree agree agree

8. To be sure that I teach students all necessary content and skills, I follow a textbook or workbook.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

9. I teach subjects separately, although I am aware of the overlap of content and skills.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

10. I involve students in evaluating their own work and setting their own goals.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

11. When there is a dispute between students in my classroom, I try to intervene immediately to resolve the problem.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

12. I believe students learn best when there is a fixed schedule.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

13. I make it a priority in my classroom to give students time to work together when I am not directing them.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

14. I make it easy for parents to contact me at school or home.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

15. For assessment purposes, I am interested in what students can do independently.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

16. I invite parents to volunteer in or visit my classroom almost any time.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

17. I generally use the teacher's guide to lead class discussions of a story or text.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

18. I prefer to assess students informally through observations and conferences.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

19. I find that textbooks and other published materials are the best sources for creating my curriculum.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

20. It is more important for students to learn to obey rules than to make their own decisions.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

21. I often create thematic units based on the students' interests and ideas.

1	2	3	4	5	6
strongly disagree	disagree	somewhat disagree	somewhat agree	agree	strongly agree

Appendix D

Teacher Sense of Self-Efficacy Instrument

Part 1: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below by choosing one number. Your answers are confidential.

(A 9-point scale will be provided for each item, with anchors at 1--nothing, 3--very little, 5--some influence, 7--quite a bit, and 9--a great deal).

1. How much can you do to control disruptive behavior in the classroom?

1	2	3	4	5	6	7	8	9
nothing		very little		some influence		quite a bit		a great deal

2. How much can you do to motivate students who show low interest in schoolwork?

1	2	3	4	5	6	7	8	9
nothing		very little		some influence		quite a bit		a great deal

3. How much can you do to get students to believe they can do well in schoolwork?

1	2	3	4	5	6	7	8	9
nothing		very little		some influence		quite a bit		a great deal

4. How much can you do to help your students value learning?

1	2	3	4	5	6	7	8	9
nothing		very little		some influence		quite a bit		a great deal

5. To what extent can you craft good questions for your students?

1	2	3	4	5	6	7	8	9
nothing		very little		some influence		quite a bit		a great deal

6. How much can you do to get children to follow classroom rules?

1	2	3	4	5	6	7	8	9

nothing very little some influence quite a bit a great deal

7. How much can you do to calm a student who is disruptive or noisy?

1 2 3 4 5 6 7 8 9

nothing very little some influence quite a bit a great deal

8. How well can you establish a classroom management system with each group of students?

1 2 3 4 5 6 7 8 9

nothing very little some influence quite a bit a great deal

9. How much can you use a variety of assessment strategies?

1 2 3 4 5 6 7 8 9

nothing very little some influence quite a bit a great deal

10. To what extent can you provide an alternative explanation or example when students are confused?

1 2 3 4 5 6 7 8 9

nothing very little some influence quite a bit a great deal

11. How much can you assist families in helping their children do well in school?

1 2 3 4 5 6 7 8 9

nothing very little some influence quite a bit a great deal

12. How well can you implement alternative strategies in your classroom?

1 2 3 4 5 6 7 8 9

nothing very little some influence quite a bit a great deal

Appendix E

The Home Literacy Environment Questionnaire

Directions: This questionnaire is designed to help us gain a better understanding of the literacy environment at home and the kinds of things that create difficulties for students. There are 33 statements. It should take approximately 30 minutes. Please indicate your opinion about each of the statements below. Your answers are confidential.	Never / Rarely		Frequently		Very Frequently / Always	
1. I complete and expand my child's utterances (e.g., "The boy is crying." with "Yes, the boy is crying because he hurt himself.")	(1)	(2)	(3)	(4)	(5)	(6)
2. When I talk to my child, I use grammatically correct sentences.	(1)	(2)	(3)	(4)	(5)	(6)
3. I talk to my child about how he/she has spent his/her day.	(1)	(2)	(3)	(4)	(5)	(6)
4. I answer my child's questions and offer explanations, even if he/she repeats a question many times.	(1)	(2)	(3)	(4)	(5)	(6)
5. I try to explain things that I believe my child understands.	(1)	(2)	(3)	(4)	(5)	(6)
6. I praise my child when I notice progress in his/her speech.	(1)	(2)	(3)	(4)	(5)	(6)
7. I encourage my child to talk to peers and adults.	(1)	(2)	(3)	(4)	(5)	(6)
8. If I do not understand my child, I ask him/her to repeat or explain his/her utterance.	(1)	(2)	(3)	(4)	(5)	(6)
9. I answer my child's questions consistently.	(1)	(2)	(3)	(4)	(5)	(6)
10. I correct my child's use of the dual and plural, and encourage her/him to use it correctly.	(1)	(2)	(3)	(4)	(5)	(6)
11. I correct my child's use of the past and the future tenses, and encourage him/her to use them correctly.	(1)	(2)	(3)	(4)	(5)	(6)
12. I read picture books with my child.	(1)	(2)	(3)	(4)	(5)	(6)
13. I read to my child whenever he/she wants me to.	(1)	(2)	(3)	(4)	(5)	(6)
14. I go to the library with my child.	(1)	(2)	(3)	(4)	(5)	(6)
15. At the library, my child borrows the books he/she wants.	(1)	(2)	(3)	(4)	(5)	(6)
16. I go to the theatre or cinema with my child.	(1)	(2)	(3)	(4)	(5)	(6)
17. I talk to my child about the play or movie he/she has seen.	(1)	(2)	(3)	(4)	(5)	(6)

18. I buy my child books or picture books as gifts.	(1)	(2)	(3)	(4)	(5)	(6)
19. I read books to my child.	(1)	(2)	(3)	(4)	(5)	(6)
20. I encourage my child to narrate when looking at pictures.	(1)	(2)	(3)	(4)	(5)	(6)
21. When I play with my child, I narrate and describe different objects and toys.	(1)	(2)	(3)	(4)	(5)	(6)
22. I play with my child at least half an hour a day.	(1)	(2)	(3)	(4)	(5)	(6)
23. I watch TV with my child.	(1)	(2)	(3)	(4)	(5)	(6)
24. I talk to my child about what he/she has seen on TV.	(1)	(2)	(3)	(4)	(5)	(6)
25. I talk to my child about what he/she would like to do.	(1)	(2)	(3)	(4)	(5)	(6)
26. I allow my child to interrupt me and ask questions while I'm reading to him/her.	(1)	(2)	(3)	(4)	(5)	(6)
27. I allow my child to create his/her own stories while I'm reading to her.	(1)	(2)	(3)	(4)	(5)	(6)
28. While reading to my child, I talk to him/her about the content of the book.	(1)	(2)	(3)	(4)	(5)	(6)
29. I teach my child to count.	(1)	(2)	(3)	(4)	(5)	(6)
30. I encourage my child to learn to read a few words (e.g. his/her name).	(1)	(2)	(3)	(4)	(5)	(6)
31. I encourage my child to learn letters (e.g. I show her letter in the book, I teach her letters in her name).	(1)	(2)	(3)	(4)	(5)	(6)
32. When talking to my child, I use long and complicated sentences (e.g. complete sentences, compound sentences, subordinate clauses).	(1)	(2)	(3)	(4)	(5)	(6)
33. When talking to my child, I try to speak in a manner similar to hers (e.g. I call objects as she does, I use childish speech).	(1)	(2)	(3)	(4)	(5)	(6)

Appendix F

Needs Assessment Interview Questions

1. What are some of the teacher qualities, in terms of knowledge, that you consider crucial with being an effective teacher?

2. What are some of the teacher qualities, in terms of skills, that you consider crucial with being an effective teacher?

3. What are some of the teacher qualities, in terms of attitudes, that you consider crucial with being an effective teacher?

4. What teacher education have you received prior to entry into service as teachers?

5. How has that education contributed to your ideas about teaching, specifically with regard to planning?

6. How has that education contributed to your ideas about teaching, specifically with regard to instruction and classroom management?

7. To what extent has your own school and college experiences been influential in developing your skills as a teacher, specifically with regard to planning?

8. To what extent has your own school and college experiences been influential in developing your skills as a teacher, specifically with regard to instruction and classroom management?

9. Has the professional development opportunities (including workshops, training programs, conferences, and courses) provided through the institute been influential in developing your skills as a teacher, specifically with regard to planning? To what extent?

10. Has the professional development opportunities (including workshops, training programs, conferences, and courses) provided through the institute been influential in developing your skills as a teacher, specifically with regard to instruction and classroom management? To what extent?

11. What are some of the challenges you face in teaching and learning in current classrooms?

12. Do you deem knowledge about the child's socio-cultural background, including information about his/her language, aesthetics (appearance), religion, values, attitudes, social organizations, family, community, role or status among others, essential with regard to your teaching? (follow up) Why or why not?

13. In what ways do you think the knowledge about the child's socio-cultural background would influence your teaching practices?

14. Do you consider collaboration between teachers within the school an essential component? Why?

15. How would collaboration between teachers impact your effectiveness as a teacher?

Appendix G

Post Intervention Teacher Interview Questions

1. How have the workshops' content & format contributed to your 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, 3) knowledge and skill regarding learning & teaching, 4) ideas or beliefs about teaching and learning, 5) current classroom practices, and 6) helped to align your beliefs with your teaching practices?

2. How has the PLCs' content & format contributed to your 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, 3) knowledge and skill regarding learning & teaching, 4) ideas or beliefs about teaching and learning, 5) current classroom practices, and 6) helped to align your beliefs with your teaching practices?

3. How has the coaching with your language coordinator sessions' contributed to your 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, 3) knowledge and skill regarding learning & teaching, 4) ideas or beliefs about teaching and learning, 5) current classroom practices, and 6) helped to align your beliefs with your teaching practices?

4. How have increased reflective opportunities contributed to your ideas or beliefs about teaching and learning?

5. How have the increased reflective opportunities impacted your current classroom practices?

6. How has increased awareness of your beliefs and the discrepancies between your beliefs, and practices contributed to your ideas or beliefs about teaching and learning?

7. How has increased awareness of your beliefs and the discrepancies between your beliefs, and practices impacted your current classroom practices?

8. What do you deem is the learners' role in the learning process?

9. What do you deem is the teacher's role in the learning process?

10. How necessary is it to adhere to the curriculum guidelines while teaching?

11. How has the additional knowledge and skill obtained during professional development contributed to your ideas or beliefs about teaching and learning?

12. How has the additional knowledge and skill obtained during professional development impacted your current classroom practices?

Appendix H

Participant-driven Workshops - Reflective Prompts

- What are your big take-aways from today's workshop?
- Do your current classroom practices reflect any of the ideas / strategies introduced today? Can you provide some examples?
- Can you briefly explain the idea (content of the workshop) in your own words?
- How are you planning to implement the ideas or strategies introduced today in your classroom or in instructing your students?

Appendix I

Language PLC Agenda Template

Date: _____

Time: _____

Members: _____

1. **Sharing Time** (any tool, strategy, idea using templates, videos, books, or other resources) (10 minutes)

2. **Reflections on readings** (books / research articles) (10 minutes)

Reading Reflections

	Big Ideas	**Personal Take-Aways**
a)		
b)		
c)		

3. **Reflections using video recordings of teachers** (10 minutes)
    - Discuss some of the effective instructional practices used by the teacher?
    - What are some of the instructional practices that require improvement? How can they be addressed?
    - Was this activity / routine / structure demonstrated successful? Why or why not?

- Did the teachers' actions demonstrate the belief that all students are capable of learning?
- Did the teachers' instructional practices meet the needs of all students equally and appropriately?

4. **Follow-up from previous meeting** (5 minutes)

5. **Updates / Consultative Matters** (can include student work, assessments, planning, new tools or resources, collaboration with other department discussions, etc.) (5 minutes)

6. **Conclusion** (summary of important points and To-Do's)

Appendix J

Coaching Agenda Template

Date: _____

Time: _____

Coaching Template

Coach Observations	**Teacher Reflections**	**Teacher questions & comments**	**Action Plan**
I see…. I think…. I wonder…			

Appendix K

Summary Matrix

Evaluation summary matrix

Research question	**Indicator**	**Data source**	**Frequency**	**Data Analysis**
RQ1 – To what extent did the professional development provide members with participant driven workshops, coaching facilities, professional learning community meeting spaces, reflective practices, structures (space and time), and a culture of trust on an ongoing basis for the intervention period? a. To what extent did members participate in professional development sessions, including participant driven workshops, coaching meetings, and professional learning community meetings?	Delivery of professional development sessions obtained from documented session logs from the school's Google drive	Documented session logs from the school's Google drive Audio recordings of coaching sessions Video recordings of PLC meeting Teacher interviews	Monthly basis - record maintained Once - End of the intervention	Delivery – high and low fidelity Attendance data – high & low fidelity
RQ2 - How did teachers' exposure to professional development lead teachers to adopt more reflective practices, increase their awareness of beliefs and discrepancies between their beliefs and practices, and increase their perceptions of knowledge and skills in constructivist teaching and learning?	Data from teacher's responses during PD sessions (workshops, PLCs, coaching) Data from teachers' interviews Teachers' reflections Teachers' awareness of beliefs and discrepancies between their beliefs and practices Teachers' increased knowledge & skills of constructivist teaching and learning	Documented session logs from the school's Google drive Audio recordings of coaching sessions Video recordings of PLC meeting Teachers' Interview	Monthly basis - record maintained Once – end of the intervention study	Qualitative data - Emergent & deductive codes and themes
RQ3 – How did teachers' exposure to the professional development	Teachers' scores on the belief survey	Teacher Belief Survey	Twice – baseline (prior to intervention),	Quantitative data – compare pre

Evaluation summary matrix

Research question	**Indicator**	**Data source**	**Frequency**	**Data Analysis**
and the short-term outcomes (i.e. increase in teachers' 1) reflective practices, 2) awareness of beliefs and discrepancies between beliefs and practices, and 3) knowledge and skills in constructivist practices) change their beliefs about teaching, instructional practices in the classroom, and the alignment between their beliefs and practices?	Teachers' score on efficacy scale Teacher's average score for each indicator on the Danielson framework Data from teachers' interviews Teachers' reflections Teachers' awareness of beliefs and discrepancies between their beliefs and practices Teachers' increased knowledge & skills of constructivist teaching and learning	Teacher Efficacy Scale Framework for Teaching evaluation system Documented session logs from the school's Google drive Audio recordings of coaching sessions Video recordings of PLC meeting Teachers' Interview	and post intervention Monthly basis - record maintained Once – end of the intervention study	and post test scores Qualitative data - Emergent & deductive codes and themes Compare quantitative scores & qualitative data for beliefs, and practices

Appendix L

Teacher Efficacy Scale

(Gibson & Dembo, 1984)

Please indicate the degree to which you agree or disagree with each statement by circling the appropriate numeral to the right of each statement.

1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
PTE 1.	When a student does better than usual, many times it is because I exerted a little extra effort.	1	2	3	4	5	6
GTE Reverse code 2.	The hours in my class have little influence on students compared to the influence of their home environment.	1	2	3	4	5	6
GTE 3.	The amount that a student can learn is primarily related to family background.	1	2	3	4	5	6
PTE 4.	When a student is having difficulty with an assignment, I am usually able to adjust to his her level.	1	2	3	4	5	6
GTE Reverse code 5.	If students aren't disciplined at home, they aren't likely to accept any discipline.	1	2	3	4	5	6
PTE 6.	When I really try, I can get through to most difficult students.	1	2	3	4	5	6
GTE Reverse code 7.	A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on her/his achievement.	1	2	3	4	5	6
PTE 8.	When the grades of my students improve it is usually because I found more effective teaching approaches.	1	2	3	4	5	6
PTE 9.	If a student masters a new concept quickly, this might be because I knew the necessary steps in teaching that concept.	1	2	3	4	5	6
GTE	If parents would do more with their children, I could do more.	1	2	3	4	5	6

10.							
PTE 11.	If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson.	1	2	3	4	5	6
PTE 12.	If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly.	1	2	3	4	5	6
GTE 13.	The influences of a student's home experiences can be overcome by good teaching.	1	2	3	4	5	6
GTE Reverse code 14.	Even a teacher with good teaching abilities may not reach many students.	1	2	3	4	5	6
PTE 15.	When a student gets a better grade than he usually gets, it is usually because I found better ways of teaching that student.	1	2	3	4	5	6
PTE 16.	If one of my student's couldn't do a class assignment, I would be able to accurately assess whether the assignment was at the correct level of difficulty.	1	2	3	4	5	6

Appendix M

Literature Support for Codes and Themes used for Qualitative Analysis

Literature support for the codes and themes used with the qualitative data from teacher's responses during workshops, PLC, and coaching meetings, and teacher interview data.

Theme	Codes	Literature Support
Reflection	• "Reflection in action" • "Reflection on action" • "Reflection using dialogue and feedback" • "Reflection within communities of practice" • "Reflection using modeling"	• Schon (1983) has referred to reflection in action that allows for inspecting and thinking about the practices as they are occurring, and reflection on action, which is referred to as thinking back at one's practices, examining, and evaluating it to further understanding. • Researchers have provided teachers with structured opportunities for dialogue and feedback to engage in reflective practices with a coach with opportunities (Darling-Hammond & Richardson, 2009). This allows teachers to examine their beliefs and practices in a more objective manner while allowing for perspective sharing on practices that are contextual (Harrison, Lawson, & Wortley, 2005; Poom-Valickis & Mathews, 2013). • Some scholars have used professional development programs with communities of practice to allow teachers to engage in critical reflective learning (Ng & Tan, 2009). • Also, modeling provides teachers with the opportunity to notice, think about, and reflect on teacher practices in the classroom (Coffey, 2014; Wang & Hartley, 2003). Wang and Hartley (2003) highlight that models can be used to highlight and reflect closely on issues of teaching and learning in action.
Awareness of beliefs and discrepancies between beliefs and practices	• "Recognition of discrepancy based on acquired knowledge" • "Inconsistent pedagogical beliefs and instruction" • "Limited beliefs and practices" • "Inconsistent lesson planning beliefs and practices" • "Uncertainty between beliefs and practices" • "Difficulty aligning beliefs and practices"	• Theriot & Tice (2009) highlight that teachers' articulating and espousing certain beliefs about teaching does not warranty the transference of these beliefs into instructional practices, due to the teachers' lack of knowledge in dealing with unanticipated hindrances and barriers. • Since teachers in India are more likely subjected to traditional approaches to learning and teaching (Batra, 2005), and they have received limited opportunities to challenge their beliefs, teachers are ambiguous regarding their beliefs and tend to adopt cultural aspects embedded into Indian educational institutes (Nargund-Joshi, Rogers, & Akerson, 2011). • India continues to adopt a centralized policy-making practice that allows the teacher training curriculum to be developed by individuals removed from specific contexts of teaching, resulting in lack of consideration of contextual influences (Dyer et al., 2004). Hence, teachers

		have difficulty merging their beliefs and their practices, even when based on newly acquired notions of learning and teaching.
Perceptions of Knowledge And Skill In Constructivist Teaching And Learning	• "Knowledge about constructivist literacy teaching" • "Knowledge about learner's role" • "Knowledge about constructivist pedagogical practices"	• Constructivism regards learning as an active process of constructing rather than mere acquisition of knowledge (Cunningham & Duffy, 1996; Von Glasersfeld, 2012). Hence constructivist teaching is not viewed as transference from teacher to learner, but as a process of supporting the construction through an active involvement and interaction with the environment (Cunningham & Duffy, 1996). • Constructivist teaching and learning with regard to literacy would deem reading as a transactional process between a reader and a text within a social context, rather than reading as a skill that is limited to decoding (Richardson, Anders, Tidwell, & Lloyd, 1991). Further, constructivist practices for comprehension instruction would enlist the reader as an active participant who interprets the text based on his or her own background knowledge and perceptions (Richardson et al., 1991). • Other constructivist practices in teaching include allowing the student to interact with the environment, with peers in the classroom, and the teacher so as to ask questions, determine resources, and offer viable solutions or answers (Draper, 2012). Additionally, constructivist teachers can support student learning through "modeling, contingency, managing, feeding back, instructing, questioning, and cognitive structuring" (Gallimore & Tharp, 1990, p.177).
Teacher Beliefs	• "Beliefs about learning" • "Beliefs about teaching" • "Beliefs about the role of a teacher" • "Beliefs about the role of a learner" • "Beliefs due to professional experiences" • "Beliefs due to personal experiences"	• According to Borg (2011) beliefs are "propositions individuals consider to be true and which are often tacit, have a strong evaluative and affective component, provide a basis for action, and are resistant to change" (p. 370). • Teachers' beliefs include the notions about learning and teaching that they embrace as the truth. • Teachers' beliefs are formed as a result of their personal and professional experiences (Riojas-Cortez, Alanis, & Flores, 2013; Tillema, 2000). Scholars have found the school environment to be more potent than pre-service teacher training in defining teachers' beliefs (Massengill, Mahlios, and Barry, 2005). • A constructivist perspective conceives of learning as an active, learner focused, collaborative process that results from the complex interaction between the learner's prior knowledge, the learning context, and the content at hand (Dagar & Yadav, 2016; Vijaya Kumari, 2014).

Instructional practices in the classroom	• "Content instructional strategies" • "Pedagogical instructional strategies" • "Managing classroom procedures" • "Classroom environment" • "Planning and preparation" • "Impact of coaching on instructional practices" • "Impact of reflection on instructional practices" • "Impact of teacher's beliefs on instructional practices"	• Teacher's classroom practices are described within the framework for teaching grounded in a constructivist view of learning and teaching, namely, The Framework for Teaching (Danielson, 2013). • The framework highlights different components highlighting teacher's instructional practices in the classroom, such as "content instructional strategies", "pedagogical instructional strategies", "managing classroom procedures", "classroom environment", and "planning and preparation". • Neuman & Cunningham (2009) have found coaching along with the seminar model of professional development to be most effective in impacting practices for teachers in classrooms. • Moreover, literature highlights how the intention of analyzing one's practices during reflection provokes the formation of new beliefs and accompanying practices (Dewey, 1933), in a constructive and critical manner (Poom-Valickis & Mathews, 2013). • Lastly, there is a tremendous amount of research that shows how teachers' beliefs influence their teaching practices (Doruk, 2014; Kukari, 2004; Moore, 2008; Yilmaz & Sahin, 2011) and play a significant role in teacher decision making (Stuart & Thurlow, 2000; Tillema, 2000), and teachers' understanding and ability to engage in effective interactions with students (Hamre et al., 2012).

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Experience

Gateway School of Mumbai (May 2012 – May 2018)

The Gateway School of Mumbai is a non-profit, K-12 school, established in affiliation with The Gateway Schools of New York (USA) to introduce and spread international research-based practices in the field of special education and rehabilitation therapies to Mumbai and India.

Language Program Coordinator

Designing, coordinating and implementing the Reading and Writing curriculum across the entire school, which include,

- Conducting assessments and grouping the children into ability based groups
- Overall supervision of all language instruction including the creation, review and implementation of whole school scope and sequences for language
- Conducting remedial sessions in small group settings
- Collaborating with the Speech Therapy and Library departments to enhance language delivery
- Spearheading the PD (Professional Development) for the entire team for the 'Language Curriculum'
- Providing recommendations of expenditure for activities and supplies that enhance the school programs

Lead Teacher

- Designing appropriate IEP goals and educational reports, in consultation with therapists / teachers / parents, to fit the needs of each individual child
- Lesson planning and implementation
- Monitoring classroom set-up, resource and material development

Private Practice under Mrs. Mrinalini Rathi (June 2009 – July 2011)

Remedial educator

- Implemented the language section of the IEP in one-to-one sessions with children in the age group of 5 to 12 years.

Education

Johns Hopkins University (2015 - 2018)
EdD – Mind, Brain and Teaching Specialization, Online (program requirements include a minimum of 90 graduate credits)

Dyslexia Action, England (2010 – 2011)
Alpha to Omega: Hornsby Course in Dyslexia and Literacy, E-Learning course (credit rated at level 4 by the Open University, UK)

Xavier's Institute of Counseling Psychology, Mumbai (2005 – 2006)
Diploma in Counseling Psychology

S.N.D.T. College, Mumbai (2003 – 2005)
Master's of Arts, Clinical Psychology

Mumbai University (1999 – 2002)
Bachelor of Arts, Psychology

Under took workshops on *'Learning styles', 'Mind-mapping'* and on *'Creating a thinking classroom'* at the Maharashtra Dyslexia Association (2010)

Obtained a certificate in *'Sex-Education'* and *'Personal Counseling based on Robert Carkhuff's model of Counseling'* from Institute of Human Technology, Heart to Heart Counseling Centre (2003)